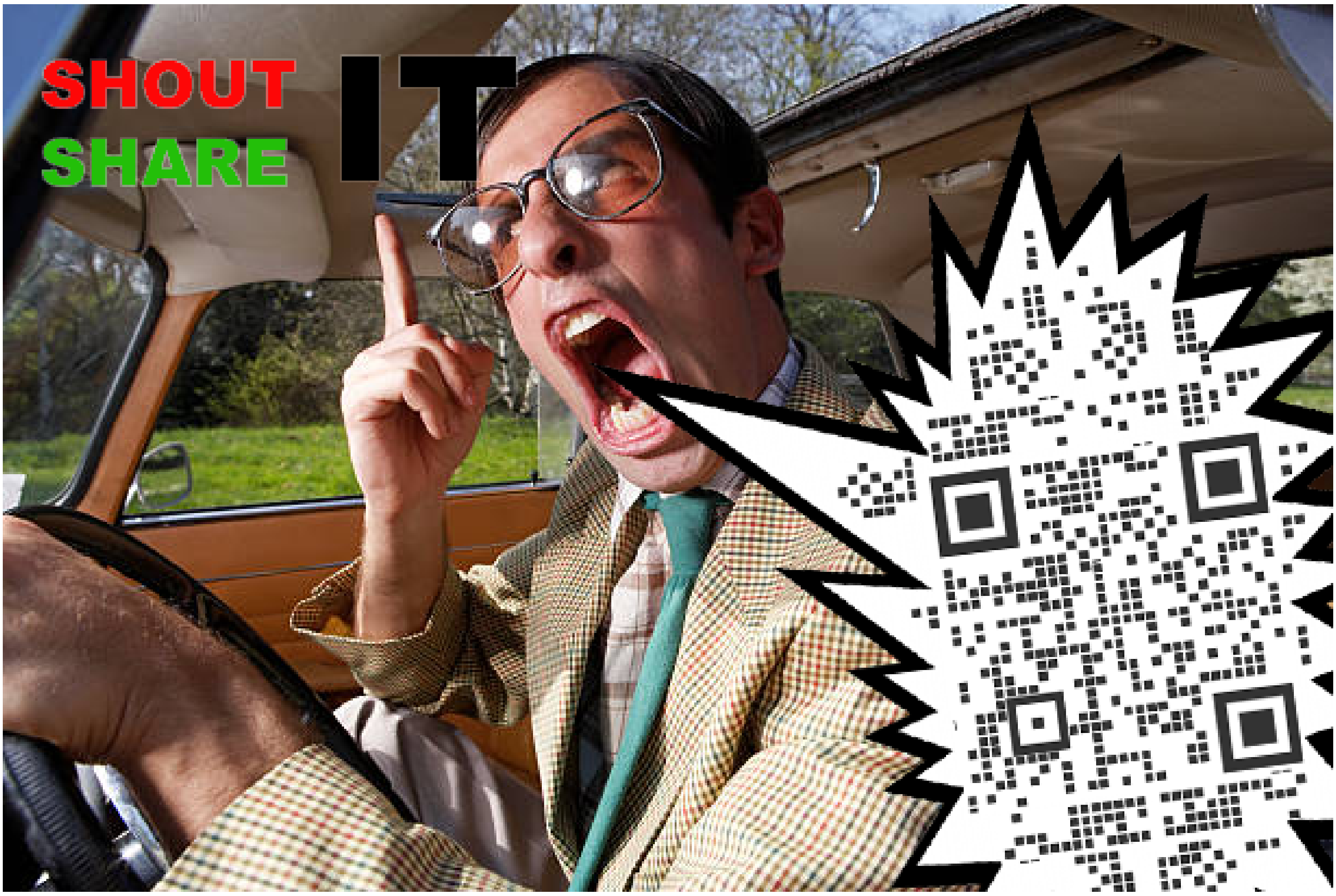

SHOUT
SHARE
IT

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

"Flowers of all hue."

VOLUME THE FIFTEENTH.

SMITHSONIAN INSTITUTION
FEB 6 194
SPECIAL COLLECTIONS

LONDON:
PUBLISHED FOR THE PROPRIETORS,
BY WILLIAM S. ORR & CO., PATERNOSTER ROW.

MDCCCXLIX.

LONDON:
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

580.543
.P34
J.D.S.

QK
1
P342
V.15, c.2
SCNHRB

301

TO

THE SUBSCRIBERS

TO

THE MAGAZINE OF BOTANY

WHO HAVE ENABLED IT FOR SO MANY YEARS TO MAINTAIN A POSITION OF
UNPARALLELED SUCCESS,

This Fifteenth Volume

IS

MOST SINCERELY AND RESPECTFULLY DEDICATED

BY

THEIR MOST OBLIGED SERVANT,

JOSEPH PAXTON.

ADVERTISEMENT.

With much pleasure and satisfaction we again appear before our readers, at the close of this, our Fifteenth Year.

We place the present volume in the hands of our subscribers, believing it will be found as interesting and useful as any of its predecessors.

The advance of the age in which we live, and the increasing taste for Botanical and Horticultural pursuits, which is, day by day, diffusing itself throughout all classes of society, demand the utmost attention on our part, and determine us to increased exertion; meanwhile, in dismissing this our Fifteenth Volume from the press, we cannot deny ourselves the pleasure of expressing our grateful sense of the encouragement we have invariably received in this and other countries; an encouragement which will enable us again to commence our labours with renewed freshness and vigour.

Chatsworth,
December 23rd, 1848.

LATIN INDEX

TO

THE COLOURED FIGURES OF PLANTS.

Acacia rotundifolia, 121
Achimenes grandiflora ignea, 121
— intermedia, 121
— rosea major, 121
— superba, 121
— venusta, 121
Æschinanthus longiflorus, 25
Agalmyla staminea, 73
Aphelexis humilis, 269

Barkeria Skinneri major, 1
Batschia canescens, 151

Cantua tricolor, 219
Casselia integrifolia, 75
Cattleya bulbosa, 49
Chætogastra strigosa, 265
Chironia glutinosa, 245
Conradia floribunda, 99
Cymbidium eburneum, 145

Dendrobium anosmum, 97
— Farmerii, 241
Dichorizandra ovata, 3
Dielytra spectabilis, 127

Echinacea intermedia, 79
Epacris bicolor, 198
— campanulata maxima, 193
— delicata, 193
Erythrina Bidwillii, 51
Eucalyptus macrocarpa, 29
Evolvulus purpureo-cæruleus, 171

Gloxinia albo-sanguinea, 169
— Fyfiana, 169
Gloxinia Teuchlerii, 169

Hoya bella, 243

Jasminum nudiflorum, 173

Lobelia cœlestis, 103
— fulgens Marryatta, 7
— — multiflora, 7
— — pyramidalis, 7

Mitraria coccinea, 147
Mutisia ilicifolia, 101

Oncidium spilopterum, 200

Passiflora Neumannii, 270
Pleroma elegans, 27
Potentilla Menziesii, 247

Rhododendron javanicum, 217
— Standishii, 55

Salvia oppositiflora, 53
Satyrium aureum, 31
Sericographis Ghiesbreghtiana, 176
Siphocampylus manettiæflorus, 267
Stigmaphyllon ciliatum, 77
Stylidium scandens, 149
Swainsonia coronillafolia, 223

Thunbergia aurantiaca Doddsii, 221
Tillandsia stricta, 125
Torenia arracanensis, 197
— asiatica, 197
— concolor, 197
— edentula, 197
Tritonia aurea, 3

Vireya javanica, 217

Zauchneria californica, 195

ENGLISH INDEX TO THE COLOURED FIGURES OF PLANTS.

Acacia, round-leaved, 123
Achimenes, great flowered, fiery red, 121
— intermediate flowered, 121
— large rose-coloured, 121
— superb, 121
— lovely, 121
Æschinanthus, long-flowered, 25
Agalmyla, long-stamened, 73
Aphelexis, dwarf, 269

Barkeria, Mr. Skinner's large-flowered, 1

Cantua, two-coloured, 219
Casselia, entire-leaved, 75
Cattleya, bulbous, 49
Chætogastra strigose, 265
Chironia, glutinous, 245
Cinquefoil, Mr. Menzies', 247
Conradia, bundle-flowered, 99
Coral flower, Bidwill's, 51
Cymbid, ivory-flowered, 145

Dendrobe, scentless, 97
— Mr. Farmer's, 241
Dichorizandra, ovate-leaved, 3
Dielytra, showy, 127

Epacris, two-coloured, 193
— large campanulate-flowered, 193
— delicate, 193
Evolvulus, purple and blue, 171

Gloxinia, white and scarlet, 169
— Mr. Fyfe's, 169
— Mr. Teuchler's, 169
Gum-tree, large-fruited, 29

Hedge-hog flower, intermediate, 79
Hoya, beautiful, 243

Jasmine, naked-flowered, 173

Lobelia, heavenly blue, 103
— Mrs. Marryatt's, fulgent, 7
— many-flowered, fulgent, 7
— pyramidal, fulgent, 7

Mitraria, scarlet, 147
Mutisia, holly-leaved, 101

Oncia, spotted-winged, 200

Passion-flower, Mr. Neumann's, 270
Pleroma, elegant, 27
Puccoon, canescent, 151

Rhododendron, Java, 217
— Mr. Standish's, 55.

Sage, opposite-flowered, 53
Satyrium, golden-flowered, 31
Sericographis, Mr. Ghiesbeght's, 176
Siphocampylos, manettia-flowered, 267
Stigmaphyllon, ciliated-leaved, 77
Stylidium, scandent, 149
Swainsonia, coronilla-leaved, 223

Thunbergia, Mr. Dodd's orange-flowered, 221
Tillandria, straight, 125
Torenia, Arracan, 197
— Asiatic, 197
— purple-blotched, 197
— self-coloured, 197
Tritonia, golden-flowered, 3

Vireya, Java, 217

Zauchneria, California, 195

WOODCUT ILLUSTRATIONS.

VOLUME THE FIFTEENTH.

Achras sapota, 108
Acorus Calamus, 238
Agallochum, 46
Agalmyla staminea, 74
Algum or Almug, 116
Aloexylon Agallochum, 46
Andropogon Calamus aromaticus, 238
Anona Cherimolia, 135
— muricata, 135
— squamata, 135
Aquilaria Agallochum, 46
Artemisia judaica, 255
Averrhoa Bilimbi, 231
— Carambola, 231

Balm of Gilead, 140
Balsamodendron gileadensis, 140
— Katif, 140
— Myrrha, 140
— africanum, 93
Blimbing, 231
Boswellia serrata, 93

Calamus aromaticus, 238
— rudentum, 238
Cane Calamus, 238
Capparis ægyptiaca, 255
Carambola, 231
Celebes Mangosteen, 207
Ceradia furcata, 93
Cherimoyer, 135
Chrysophyllum Cainito, 184
— microcarpum, 184
— Michino, 184
— monopyrenum, 184
Colophonia zeylanica, 140
Cookia punctata, 262
Cucumber tree of Goa, 231
Cymbidium eburneum, 146

Dendrobium anosmum, 98
Dichorizandra ovata, 6
Dielytra spectabilis, 128

Euphoria Litchi, 87
— Longana, 87

Frankincense, 93

Garcinia Mangostana, 207
Gopher Wood, 213
Gymnostomum truncatulum, 255

Hog-plum, 42
Hyssop of Ancients, 255
Hyssopus orientalis, 255

Jambosa vulgaris, 62

Kalosanthes coccineus, 68

Lawsonia alba, 213

Lee Chee, 87
Lign Aloes, 46
Longan, 87

Mangifera indica, 160
— oppositifolia, 160
Mango, 160
Mangosteen, 207
Merian, 160
Michino, 184
Mustard tree, 188
Myrrh, 140

Nardostachys Jatamansi, 163

Pterocarpus Santalinus, 116

Rose-apple, 62

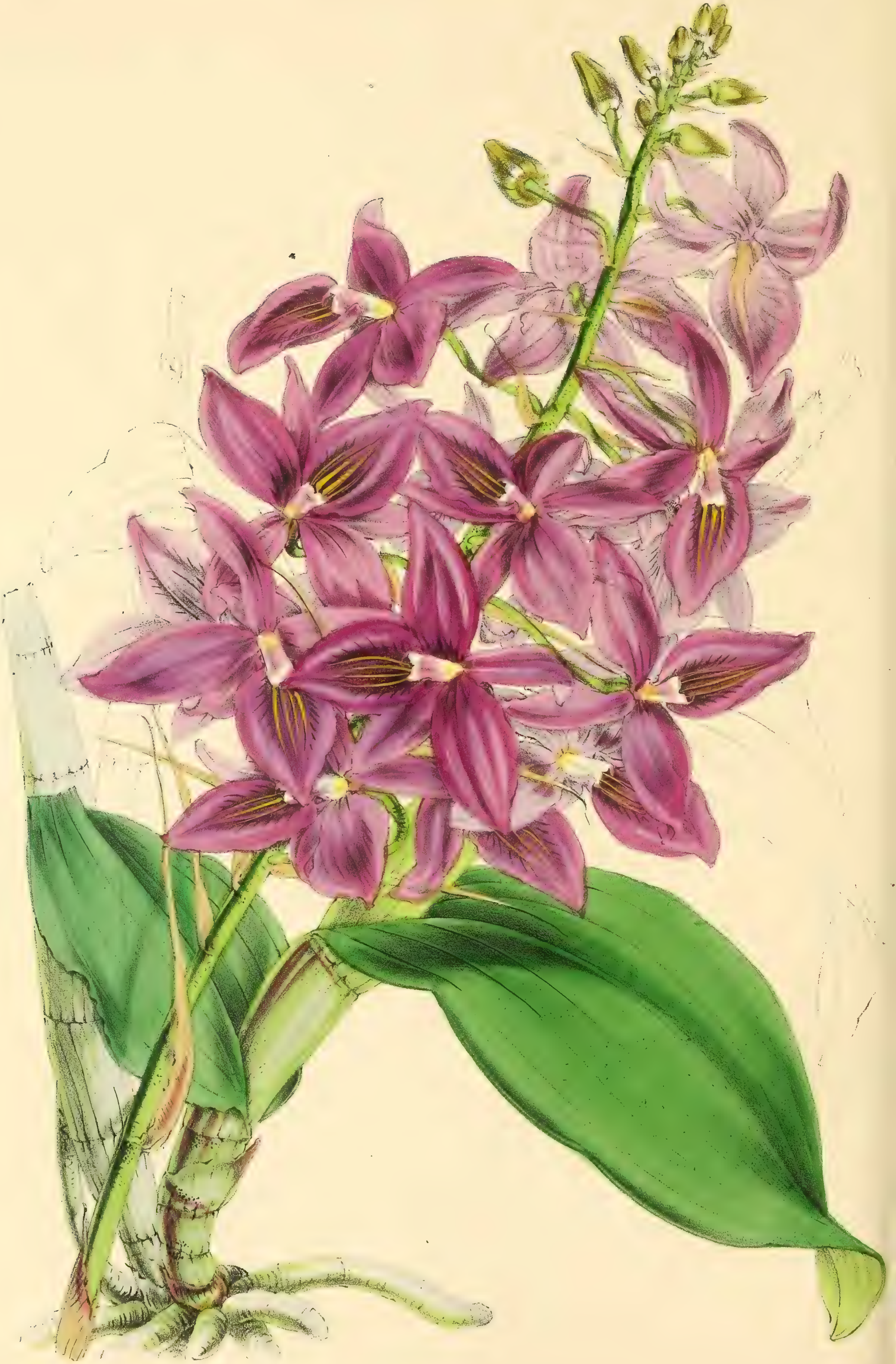
Salvadora persica, 188
Sandal-wood, 116
Sandoricum indicum, 116
Sapota plum, 108
Sinapis Kaba, 188
Spikenard, 163
Spondias lutea, 42
Stalagmitis celebica,
Star-apple, 184
Sweet Flag, 238

Trichostomum aciculare, 255

Valeriana celtica, 163

Wampee tree, 262

Zauchneria californica, 196



S Holden. del. & Lith.

Barkeria Skinneri major.

BARKÈRIA SKÍNNERI, *var.* MÀJOR.

(Mr. Skinner's Barkeria, large Variety).

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

Generic Character.—*Sepals* and *Petals* equal, free, membranous, very spreading. *Labellum* smooth, entire, naked, cuneate and pointed, pressed close to the column. *Column* petal-shaped. *Anthers* four-celled, fleshy. *Pollen-masses* four, with as many ligulate, reflexed caudiculæ, connate in pairs.

Specific Character.—*Plant* an epiphyte. *Stems* cylindrical and leafy, growing nine inches or more high, and terminating in a long slender raceme of flowers. *Leaves* lanceolate, acute, fleshy, four to six inches long. *Raceme* loose, many-flowered. *Flowers* of a fine lilac-purple. *Sepals* spreading, linear-lanceolate, acuminate. *Petals* spreading, ovate-lanceolate, acute. *Labellum* ovate-lanceolate, acuminate, with a yellow fleshy crest, five-keeled. *Column* with two rounded wings.

Synonymes and Authorities.—Barkeria Skinneri, *Lindley*, in *Bot. Reg.*, v. xxvi., 81 *Descrip.* Epidendrum Skinneri, *Batem. MSS.* in *Bot. Reg.*, t. 1881. Epidendrum Skinneri, *Hooker*, in *Bot. Mag.*, t. 3951.

Variety Major.—Flower scape nearly two feet long, holding upwards of thirty flowers of a deep reddish-lilac purple, with stripes of bright gold colour down the lip. In habit it is much stronger, the foliage longer and double the breadth, apparently less delicate than the species, and in every way superior.

The subject of our present plate is a beautiful variety of *Barkeria Skinneri*, which flowered in the extensive collection of Messrs. Loddiges, in November, 1847, and through whose kindness we were at that time permitted to make our drawing. The original species, which is perhaps better known by the name of *Epidendrum Skinneri*, is a native of Guatemala, where it was discovered and introduced by Mr. Skinner. It flowered in 1841, in the splendid collection of J. Bateman, Jun., Esq., by whom it received the name it bears in honour of its discoverer.

We regret that we are unable to say who was the discoverer of *B. Skinneri major*, neither do we know the exact locality in which it was found. It is certainly a superior variety, and a very free bloomer, and with the following treatment will grow well.

It requires, in common with other South American Orchids, the humid atmosphere and temperature of the Orchid-house, but, like *B. Skinneri*, it does not flourish if subjected to a very close and strong heat; about 70° is sufficient during even the time of its most vigorous growth, and it should also be hung in some part of the house where it can daily receive a little air; in its intermediate or flowering season, a lower temperature should be given, and during the time of its torpidity, should be kept quite cool and dry.

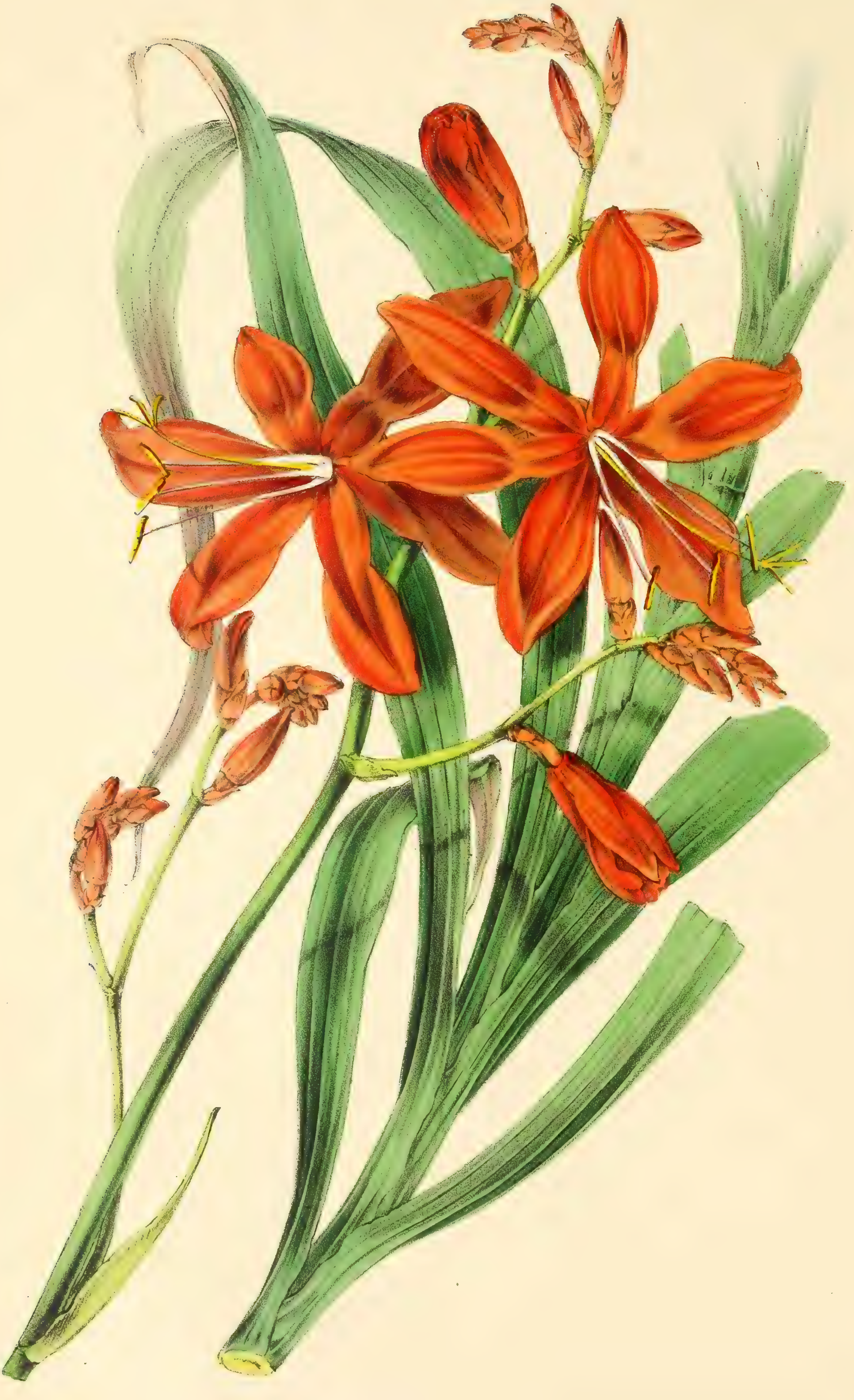
During the period of growth the atmosphere should be kept very humid, and the plant should receive a good supply of tepid water both at the roots and over the leaves and stems. In the time of flowering altogether dispense with syringing, and give but a limited proportion of water to the roots ; and during the season of repose, allow it to become pretty dry ; but in no state of its existence expose it to an arid atmosphere.

It will not grow if potted in rough peat, whatever attention may be bestowed. The best way is, to plant it in an open formed rough-wooden or other basket, filled with sphagnum and potsherds, which should be hung from the roof of the house ; it also grows freely if fastened to a naked block of wood.

Increase is effected in the same manner as the other species of *Barkeria.*

The generic name is given in honour of the late G. Barker, Esq., of Springfield, near Birmingham, a celebrated grower of Orchids ; the species is named after Mr. Skinner, its discoverer, and the variety is named *major* on account of the large size of the flowers, and the robust habit of the plant when compared with the species.

DSI



S.Holden, del & Lith.

Tritonia aurea.

TRITÒNIA AÙREA.

(Golden Tritonia.)

Class.
TRIANDRIA.

Order.
MONOGYNIA.

Natural Order.
IRIDÀCEÆ.
(Irids, *Veg. King.*)

Generic Character.—*Spatha* two-valved. *Perianth* somewhat campanulate or tubular, with a six parted, regular, or somewhat bilabiate limb. *Stamens* three, arising from the base of the sepals; *filaments* filiform. *Ovary* ovate, three-celled, cells many-seeded. *Style* one, filiform. *Stigmas* three, spreading.

Specific Character.—*Plant* a bulbous perennial. *Bulb* in the shape of a flattened sphere, striated, dark brown. *Scape* eighteen inches high, the lower part leafy, the upper part merely bracteate and forming a many-flowered, flexuous panicle. *Leaves* sword-shaped, acuminate, long, narrow, and with a prominent midrib. *Spatha* two-leaved, coloured. *Perianth* rich golden orange; *tube* almost an inch long, slender, curved; *limb* spreading, segments oblong-ovate. *Stamens* and *style* longer than the sepals.

Synonymes and Authorities.—Tritonia aurea, *Pappe, MS.* in *Hook. Herb.* T. aurea, *Hooker*, in *Bot. Mag.*, t. 4335. T. aurea, *Lindley*, in *Bot. Reg.*, vol. xxxiii, t. 61.

For the opportunity of figuring this fine species of *Tritonia* we are indebted to Mr. James Backhouse, of York, in whose nursery it flowered profusely in August, 1847, and by whom it was recently introduced from Caffraria. It is certainly the most beautiful kind known of this interesting genus, and must be considered a valuable acquisition, being easy of culture, a profuse flowerer, and the colour being of so rich an orange.

From the situations in which it is found in its native country, we consider its treatment should be as follows:—

The bulbs should be either potted and placed in a frame or a cool part of the greenhouse, or, which is better, planted out into a frame or on a warm border in front of the green or hothouse, or in any other sheltered place exposed to the rays of the sun. This should be done either in October or very early in Spring.

The soil in which they are planted should be made light; the best is a mixture of peat, sandy loam, and leaf mould, in equal proportions.

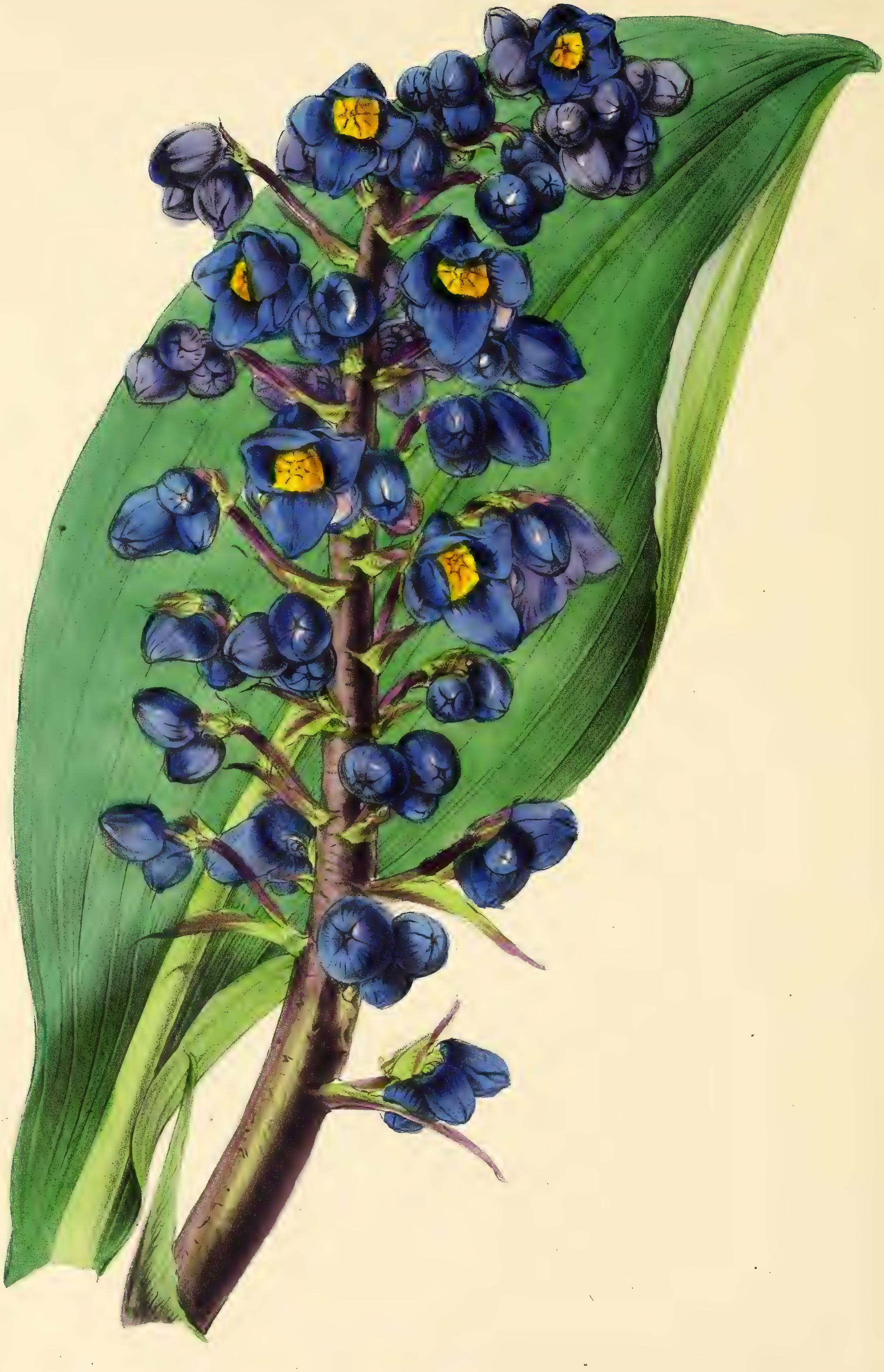
If planted in pots, protect them securely from frost and wet; but take care they have no artificial heat until the roots have spread well through the soil; then remove them to a warmer situation in the greenhouse.

When planted, do not administer water until the bulbs show signs of growth, and continue to water sparingly until the leaves and flower-stems begin to be developed, then increase the quantity to a liberal supply. When the flowering season is over, they must be treated like other Cape Irids; that is, be allowed to become perfectly dry, and be kept so during the whole of the torpid season.

If planted out in a border or frame, it is advisable to follow, as far as possible, the same rule, and during the period of their torpidity protect them from rain or snow either by means of frame-lights, or a good thickness of long litter.

During the time the plants are in flower, which is in July and August, let them, if in pots, be set in as light and airy a situation as possible, and be particularly attentive both to watering and drainage. This last item is of great importance.

The generic name is derived from *Triton*, a weathercock, in allusion to the stamens. The specific character is given in reference to the colour of the flowers.



S. Holden, del. & Lith.

Dichorizandra ovata.

DICHORISÁNDRA OVÀTA.

(Ovate-leaved Dichorisandra.)

Class.
HEXNDARIA.

Order.
MONOGYNIA.

Natural Order.
COMMELYNÀCEÆ.

(Spider-worts, *Veg. King.*)

Generic Character.—*Calyx* of three leaves, concave. *Petals* three. *Stamens* six, two of which are separated from the rest. *Anthers* two-celled, turned inwards. *Ovary* three-celled, cells few-seeded. *Style* one. *Stigma* one. *Capsule* three-sided and three-valved.

Specific Character.—*Plant*, a herbaceous perennial, growing from three to four feet high. *Leaves* ovate-lanceolate, acute, entire, smooth, shining, with parallel longitudinal veins, which are prominent on the under side, bright green above and purple beneath, and clasping the stem at the base. *Racemes* terminal, erect. *Calyx* of three ovate, obtuse sepals. *Petals* three, obtuse, entire, larger than the sepals, of nearly equal size, intense blue, the base paler. *Stamens* six, three interior and three exterior, erect. *Ovary* three-sided. *Style* filiform.

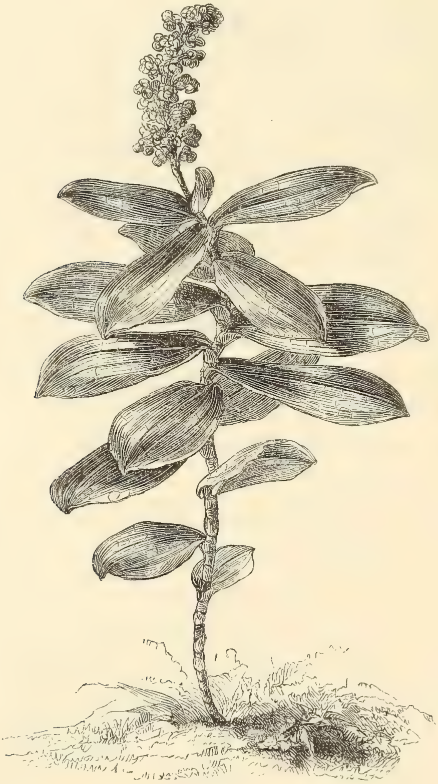
This very superior perennial herbaceous plant is a native of the Brazils, but we are unacquainted with the particulars as to the exact locality in which it was found, or by whom originally introduced. It probably found its way first into some of the continental nurseries through a botanical traveller, and from thence was introduced to our gardens. It requires the temperature of a stove where, during the period of growth and flowering, abundance of both heat and moisture can be supplied; and where, at the season of repose, it can be accommodated with a rather cool temperature and a fair proportion of drought.

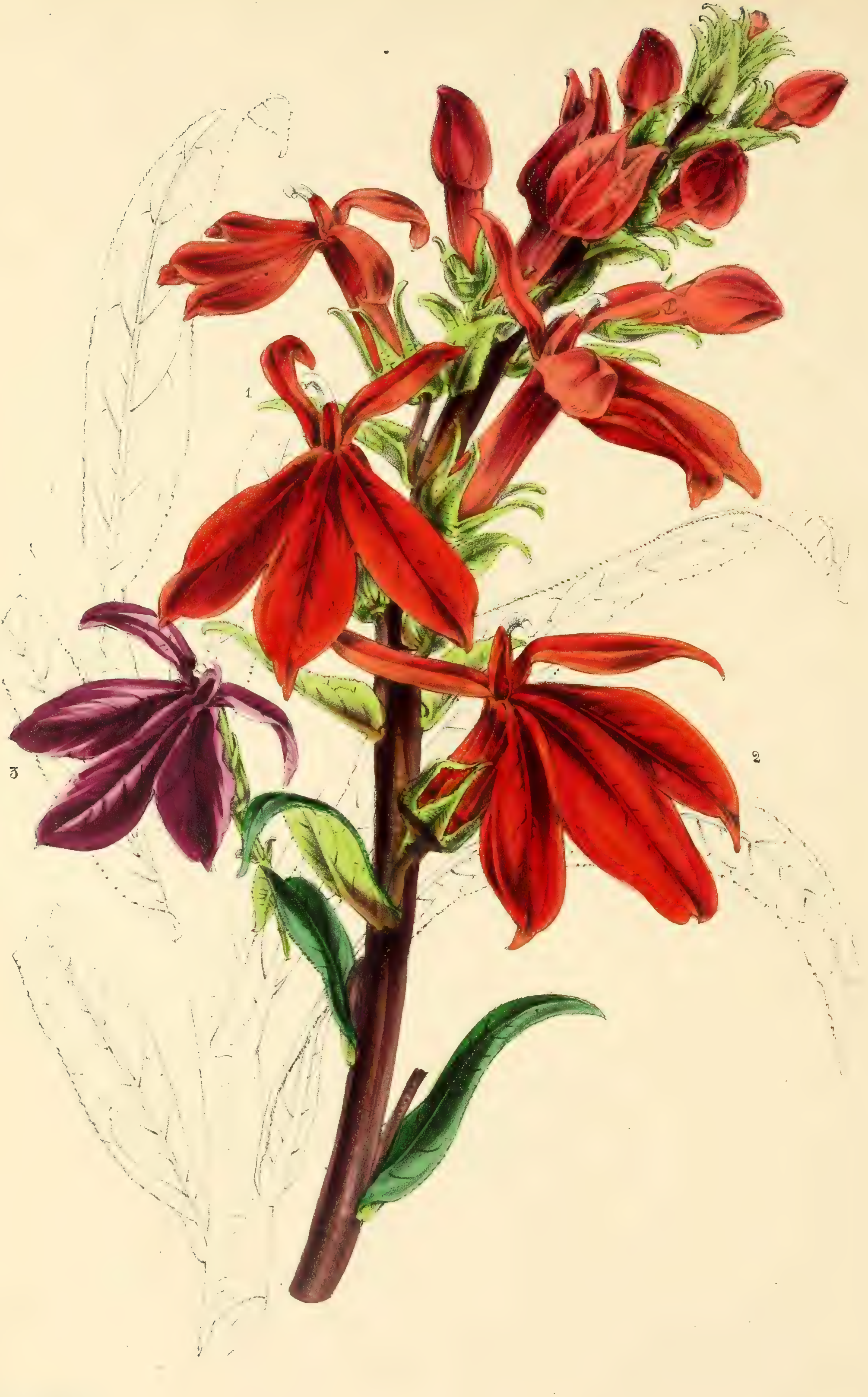
The cultivation is easy, as the plant grows very freely in equal portions of sandy loam, peat, and leaf mould. Give good drainage and plenty of room in potting, place in a warm part of the stove, and in the season of growth give a liberal supply of water at the roots, and often sprinkle the leaves with a syringe. By these means abundance of racemes of deep rich blue flowers will continue to be produced and enliven the house during the whole of the autumn months.

Increase is effected both by division of the roots and by cuttings of the ripened stems, which grow freely if planted singly in pots of light sandy soil, and placed in a warm moist temperature; but it is better to allow the cut part to cauterise a little by exposure to the air before being planted, and water should be altogether withheld until roots are formed, and if a hand or bell glass was placed over them the development of roots would be greatly facilitated.

Our drawing was made from a plant which flowered at Chatsworth during the autumn of 1847. The annexed woodcut will give a good idea of its habit and general appearance.

The genus, which is nearly related to *Cartonema* and *Tradescantia*, was established by Mikan, in his *Delectus Floræ et Faunæ Braziliensis.* Its derivation is from *dis*, twice; *choriso*, to part; and *aner*, an anther, in allusion to the separation of two of the anthers from the rest; and the specific name is given from the ovate form of the leaves.





S. Holden, del & Lith

1 Lobelia fulgens multiflora.
2. L. fulgens pyramidalis. 3 L. Marryatti pyramidalis.

LOBÈLIA FÚLGENS *var.*

(Garden Varieties of the Fulgent Lobelia.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
LOBELIÀCEÆ.
(Lobeliads, *Veg. King.*)

Generic Character.—*Calyx* five-toothed. *Corolla* tubular, irregular, cleft from the top of the tube into long divisions. *Stamens* having the anthers united and bearded. *Style* simple. *Capsule* two-celled.

Specific Character.—*Plant* herbaceous. *Stem* purplish-red, downy, growing two feet high. *Leaves* four to six inches long, lanceolate, denticulate, with revolute margins, thickly covered with a fine soft down. *Racemes* terminal, leafy. *Corolla* scarlet, an inch or more long, and downy outside.

Synonymes and Authorities.—Lobelia *Linn.*; Lobelia fulgens *Willd.* in *Hort. Berol.* ii., 85; and *Bot. Rep.*, 659.

Var. multiflora.—*Many-flowered fulgent Lobelia.*—*Stem* reddish-purple, rising to the height of four feet. *Leaves* deep green, tinged on the under side with purple. *Flowers* double the size of those of the species, of a brilliant scarlet.

Var. pyramidalis.—*Pyramidal fulgent Lobelia.*—*Flowers* double the size of those of the species; colour paler and of a brighter scarlet; segments of the corolla longer, narrower, and more acuminated than those of *multiflora*.

Var. Marryattæ.—*Mrs. Marryatt's fulgent Lobelia.*—*Stem* rising two or three feet high. *Flowers* deep crimson-purple, mottled with pale rose-colour.

The genus *Lobelia* comprehends more than 160 species; about 80 are already in cultivation; the whole are ornamental when in bloom, and some are truly splendid. Of the species already in our collections, about 22 are perfectly hardy, 12 require occasional shelter in very severe weather, and may be considered *frame plants*, 46 require the temperature of the *greenhouse*, and 2 the *stove*.

Of the *hardy* kinds, 10 are herbaceous perennials, and should be planted in a rich moist soil, where they will not be subjected to drought during the hot weather of summer, or they will dwindle, and neither grow nor flower freely; 10 are hardy annuals, and should be sown in light sandy soil in the situations they are intended to occupy for the season; and 2 are biennials, and should be sown at the same time as other hardy biennials, and treated in the same manner.

Of the frame species, 10 are herbaceous perennials, amongst which is *L. fulgens*, of which the three subjects of our plate are garden varieties. They all flowered in the garden of the late Mr. Wells, of Redleaf, Kent, and made a splendid appearance. Our drawings were made in September last.

L. fulgens multiflora sends up a flower-stem four feet or more high, and bears a profusion of flowers of the most vivid scarlet; the three lower divisions of the corolla are at least an inch and a half long, and spread out to about the same length from point to point.

L. fulgens pyramidalis differs slightly from the above in colour, being of a lighter and brighter scarlet, the lower divisions of the corolla being longer, narrower, and more pointed; the habit is the same in every respect.

Both the above were raised from seeds, by Mr. Bell of Taunton, and are certainly the finest kinds which have of late appeared.

The *L. fulgens Marryattæ* is crimson, beautifully mottled with a lighter colour. They are all most useful varieties. Their cultivation is easy; they may either be planted in a warm and moist situation in the borders, or grown in pots, at the option of the cultivator.

The best soil is composed of two parts peat and one part sandy loam; in potting, give a good drainage with sherds; for although they are plants which require a deal of water, they do not thrive if it stagnates. When the plants begin to grow, if in pots, place saucers beneath, and keep them always filled with water.

They are increased freely by suckers, by division of the roots, and by seeds.

The greenhouse species consist of 3 *shrubby* plants, which should be potted in a mixture of peat and sand, and are easily increased by cuttings; of 40 herbaceous perennials, which require to be potted in peat and sand, and are propagated by the same means as the other perennials; and of 3 biennial and annual kinds. Sow the biennial and annual kinds in pots, transplant the former as soon as they are large enough, and repot as often as necessary; but the annual species do better if not disturbed by transplantation. The two stove species are perennials, and must be treated just like the others.

Lobelias have all a milky acrid juice, and their properties are in many cases dangerous. "*Siphocampylos Caoutchouc* is so named by the inhabitants of Popayan from the tenacity of its juice. *Tupa Feuillæi* yields a dangerous poison in Chili. The most active article of the North American Materia Medica is *Lobelia inflata*. *Isotoma longiflora*, a native of some of the West India Islands, is one of the most venomous of plants; the Spanish Americans call it *Rebenta Cavallos*, because it proves fatal to horses that eat it, swelling them until they burst; taken internally, it acts as a violent cathartic, the effects of which no remedy can assuage, and which end in death. The leaves are active vesicants. *Lobelia urens*, a rare European plant, derives its name from its blistering quality. Nevertheless, it is alleged that the succulent fruit of *Centropogon surinamensis* is eatable." *

The order, which is nearly allied to Bellworts (*Campanulaceæ*) on the one hand, and Composites (*Asteraceæ*) on the other, contains 27 genera; the species of many of them, however, are yet unknown in this country, except by dried specimens and descriptions.

They are divided into three sections:—1st, *Clintoneæ*, containing 4 genera; 2nd,

---

* Lindley's Veg. King.

Lobeleæ, containing 14 genera; and 3rd, *Delisseæ*, containing 9 genera. Nearly all are herbaceous perennials, a few are shrubby, and others are annuals or biennials. The greater part are ornamental, and from amongst them a selection of really handsome flowering plants may be selected.

SECT. I.—CLINTONEÆ.

GENERA AGREEING WITH CLINTONIA IN SEVERAL IMPORTANT PARTICULARS.

CLINTONIA.—Few annuals are more pretty than the two species of Clintonia, *elegans* and *pusilla ;* they are likewise very easy of cultivation, being perfectly hardy, and only requiring to be sown in the situations where they are intended to grow. *C. Bergiana* is herbaceous, but is probably not yet introduced. The soil in which they grow must be made very light and sandy, otherwise, as they are very delicate growing plants, if the weather should prove wet, they soon perish without producing seed. They are also very pretty for pot culture, if sown in a mixture of sandy loam, peat, and leaf mould, under which circumstances they seed freely.

GRAMMATOTHECA is unknown to us except by description.

HYPSELA.—For the culture of this little plant refer to Clintonia.

LYSIPOMA.—Five species of this genus are known, but if living plants are in this country, we are not yet aware of their having flowered. They are perennial herbaceous plants with some beauty, and are natives of tropical America, therefore require the heat of the stove. A mixture of loam, peat, and sand, equal parts, is the most suitable soil for them. They are impatient of wet, and should be well drained with potsherds; it is also advisable to cramp them a little at the roots. Increase is effected by division.

SECT. II.—LOBELEÆ.

GENERA AGREEING WITH LOBELIA IN SEVERAL IMPORTANT PARTICULARS.

BYRSANTHES, DOMBROWSKYA, and HETEROTOMA.—We are only acquainted with their names.

ISOTOMA.—The species are greenhouse herbaceous perennials of easy culture. A mixture of peat, loam, and sand suits them well, and they are readily propagated by cuttings planted in sand or soil, and placed in heat; also by division of the roots, and by seeds. *I. longiflora*, or the *Hippobroma longiflora* of some authors, is the celebrated Horse-poison of the West Indies. "If it be handled, and the hand unawares applied to the eyes, it brings on a violent inflammation," not easily removed. It is well known in St. Domingo by the name of *Quedec*. *I. axillaris* and *breviflora* will grow well if planted out during the summer in the open borders, but they should be placed in a light soil, and a warm situation on a south aspect.

Dortmanna has been placed by some botanists in the genus *Lobelia*, from which, perhaps, it scarcely admits of separation. It consists of two species, both hardy herbaceous plants, one a native of this country, and the other of North America; they grow in watery and swampy places, and although not equal in beauty to many other Lobeliads, yet they certainly merit attention. They are difficult to cultivate, and on that account are not often met with in gardens, having been for the most part superseded by other plants, which, with equal attractions, are of more manageable habits. The native species, *D. lacustris*, grows pretty well planted in a small pot of coarse sand and gravel stones, and placed in a pond or cistern, where the water is often renewed, about six inches below the surface; but in winter, it is best to take it out and plunge the pot in a damp part of the garden, in a light soil, and if the weather be very severe, cover with an inverted flower-pot. In spring replace in the pond, and treat as before. The North American species, *D. palustris*, may also be grown in a small pot, filled half-full with turfy peat and potsherds, and the upper half with sphagnum: in this fix the plant; but, unlike *lacustris*, it will not bear to be immersed. Set the pot in a saucer of water, and keep the saucer always supplied, but give the plant no water on the surface; place the pot in a situation where it will not receive too much sunshine. When out of flower, remove to a frame and plunge in soil on a north aspect, or at least where the rays of the sun will not produce too much aridity; expose, however, to the air at all times, except during frosts and heavy rains. When the winter's repose is over, replace in the pan of water as before. They are both propagated by division and cuttings, which may be planted under a glass on a north border.

Laurentia and Metzlera are two genera known only by descriptions and specimens.

Monopsis consists of three species, two of which are hardy annuals, of dwarf growth, and exceedingly pretty; the other, *M. dioica*, perhaps better known by the name of *Holostigma dioica*, is a greenhouse perennial, a native of New Holland. *M. conspicua* is a little annual which ought to be cultivated in every collection; its elegant blue flowers, together with the dwarf habit of the plant, render it quite a treasure. It must be grown in light soil, or a mixture of loam and peat if grown in pots, and it is propagated by seeds, which are produced freely. *M. dioica* is increased by division of the roots.

Parastranthus is a genus not at present much known amongst cultivators. It consists of three species, all beautiful herbaceous plants, perfectly hardy, and growing freely in any light sandy soil, or, if cultivated in pots, a mixture of peat, loam, and sand are the best materials, and they readily increase by division.

Sclerotheca.—A genus established by De Candolle, but with the habits of which we are unacquainted.

Siphocampylus.—No less a number than forty-two species of this beautiful genus are known, and ten are already in cultivation in this country. Four are shrubs, and six herbaceous perennials. All require the heat of the stove, and bear large and showy scarlet or violet-coloured flowers, and well deserve to be cultivated in every collection. They are very easily managed, growing freely in a mixture of loam, peat, and sand; and cuttings of the shrubby kinds strike root freely in soil under a glass, in heat. The herbaceous kinds are increased by division of the roots.

Tupa.—Sixteen species are known in this country, all very beautiful; eleven are perennial herbaceous plants, of which two require the stove, one the greenhouse; eight need only occasional shelter in severe weather, and may be considered frame plants; and five are shrubs, growing from two to twelve feet high. They should be potted in a mixture of peat, loam, and sand, in the same manner as *Siphocampylus*, and, being of rapid growth, must have plenty of root-room. The shrubby species are propagated by cuttings of the half-ripened wood planted in pots of sand, and placed under a glass in heat, and the herbaceous ones by division: they are also raised from seeds, which are sown in pots or pans of light sandy soil, and when the young plants are up, and of a sufficient size, the shrubby ones and the tender perennial ones may be planted in pots, and the other species, which are more hardy, may be transplanted into the open borders in the front of a south wall or other sheltered situation. Here they will flower in great perfection. In winter they may be either protected with litter or dead leaves, or, which is better, taken up and potted, and so protected in a frame, greenhouse, or shed until the following spring.

Trimeris and Vlamingia are two genera, with the species of which we are unacquainted.

Sect. III.—DELISSEÆ.

GENERA AGREEING WITH DELISSEÆ IN SEVERAL IMPORTANT PARTICULARS.

Centropogon.—This genus contains thirteen species, two of which have been some time in this country. They are perennial herbaceous plants of considerable beauty, all natives of the tropics, and therefore require the temperature of the stove. They are of very easy culture, and deserve a place in every collection. The best soil for them is a mixture of peat, loam, and sand in equal proportions. In potting, give abundance of drainage, otherwise, as they require a large supply of water when in full growth, it would stagnate, and injure if not destroy the roots. When the growing and flowering season is over, gradually diminish the quantity of water, and finally set them in a cool and airy part of the house to winter, and keep them somewhat dry. Increase is effected both by division of the roots and by cuttings planted in pots of very sandy soil, and placed in a brisk moist heat, under a hand or bell glass.

Clermontia.—Three kinds of *Clermontia* are known, and have been described by botanists. They are all natives of the Sandwich Islands, but we are not aware that any living plants are at present in this country. We know them only by dried specimens and descriptions. They are all beautiful shrubs, and if introduced would be easily cultivated in a warm greenhouse, potted in a mixture of sandy loam, peat, and vegetable mould; and would, no doubt, strike freely from cuttings of the half-ripened wood, planted in sandy soil, and placed under a glass in heat.

Delissea, Kittelia, Macrochilus, and Piddingtonia, are none of them, that we are aware of, introduced, and their habits are very imperfectly known.

Pratia consists of three greenhouse perennials; they are not very ornamental, but they deserve a place amongst an extensive collection of plants. They are of very easy culture if potted in a mixture of equal parts of peat, loam, and sand, and to receive plenty of water when in a state of vigorous growth, but during the season of torpidity to be kept rather dry than otherwise, or set in a cool part of the house. Increase is effected by division of the roots and by seeds.

Rollandia.—The species are shrubby, and inhabit the Sandwich Islands. Two have been discovered and described by Gaudichaud; but, as none of them are introduced, little is known of their habits. Most likely the same treatment as that recommended for *Clermontia* would answer for these.

Rhynchopetalum.—With this genus we are altogether unacquainted, except from description.

These nine genera constitute the third section, *Delisseæ*.

Lobelia was named in honour of Mathew Lobel, author of various works, and particularly that called " Icones Plantarum ;" he was born at Lisle in 1538, became physician and botanist to James I., and died in London in 1616.

VEGETABLE ABSORPTION.

At the period when we hope to meet our readers at the commencement of another volume, Nature will have resumed activity, for the winter will have passed away. Outward appearances may be more or less strikingly different; the garden may be rich with verdure and bloom, or it may be covered with snow, and be bound with ice; still, with the undeniable increments of solar power, it must be influenced in a greater or less degree by the vivifying principle of light, which, in its passage through the organism to the earth, stimulates the roots, and induces what is termed the absorption of the sap. It is this absorption which claims our first attention.

In all cases where theoretic hypotheses supply the place of discovered truth, it becomes a duty to cite those opinions which prevail at the existing period, referring faithfully to the authority whence they are derived. On the present occasion we shall confine ourselves chiefly to those portions of a lecture by Dr. Ph. B. Ayres, on "Absorption of Nutritious Matter," that have been given in page 93 of the "Pharmaceutical Times," Nov. 6th, 1847.

"The food of plants always enters them in a liquid state, or dissolved in water. The spongy tissue of the extremities of the roots, or, as it is termed, the Spongioles, is so fine as not to permit any, even the most minute particles of solid matter, to pass through them." This opinion is conformable to the principle adopted by Dr. Lindley, and thus stated at paragraph 78 of his "Elements of Botany:"

"Absorption takes place almost exclusively by the extremities called Spongelets, or Spongioles, which consist of a lax coating of cellular tissue lying upon a concentric layer of Ducts (transparent tubes, the sides of which are marked with rings, bars, or transverse streaks). Spongioles are not, however, a distinct organ, but are merely the young extremities of the roots."

The reader will mark this last particular, as it will be found elucidatory of some critical observations which truth will claim during our investigation of the hypotheses of absorption.

"The liquid derived from the soil is not absorbed by the whole surface of the roots, but only by their minute and spongy extremities; and hence it is of great importance to preserve these when transplanting, because if they are destroyed the roots cease to absorb, and the plant dies."

We must receive this opinion with much qualification, for it admits of many exceptions. The Spongioles are, in fact, tender developments at the extremities of the growing rootlets, and therefore may, in all probability, be referred to the recently produced or growing shoots. Many of our best phytologysts in former years—the late Dr. Aikin in particular—strongly advocated the opinion, that not a single bud, or even leaf, was developed without a corresponding downward process, which connected it with the earth. The doctrine might be carried too far in actual extent, because there would be difficulty in supposing that each individual leaf could convey a root-fibre through the trunk of a tall tree into the earth; yet it is self-evident that, be the plant what it may, whether tree, shrub, or herb, its shoots must be connected with the conduits of the ascending sap; and, therefore, as the body of the plant acquires bulk during the growth of the green parts, and new rootlets are coincidently developed, it must be equally reasonable and philosophical to believe that a system of absorbents is simultaneously produced, which vessels, if they do not individually reach the earth, are inosculated with others that receive the ascending sap, and diverge from the collar of the plant. The observation that "Spongioles are not distinct organs," must be claimed as an admission of the fact that they are recent processes, connected with Spring growth in all trees and shrubs; and also with the early growth of herbaceous plants, when they revive from their condition of Winter torpor. With this view of their nature and functions, we arrive at something like a correct notion of what the Spongelets really are; and hence may be able to select the proper seasons wherein to remove every kind of plant. A few positive facts will throw light upon, and confirm, the foregoing hypothesis.

Some years since, two young walnut trees were bespoke of a nurseryman in the winter, as he had none by him at the season of autumnal planting. Nothing was heard of them till early March, when he was reminded of the circumstance; then it appeared that the two trees had been obtained, but had been carelessly overlooked and entirely forgotten. They were found in a ditch, the roots uncovered, not merely deprived of rootlets and spongioles, but partially barked, and abraded by frost. The party made many apologies, and as he doubted the possibility of success, declared that he would charge nothing for the trees. The heads were fine, and well-formed, the boles erect, and it became desirable to carry out an experiment which might prove instructive. The utmost care was taken to open extensive holes, to labor, and comminute the earth. *That* was a deep, chalky loam, rather firm in texture, and to it no manure whatever was applied. The soil was prepared to suit the form of the skeleton roots, which were deposited at a proper depth, carefully placed, and filled up with fine soil, and the stems staked and secured. Water was given, to puddle-in the soil, and the holes being filled, grass sods of the orchard were returned, and made firm. The Walnut is a late tree at all times; and thus, at any period of March, after a sharp and snowy winter, these trees, of necessity, were torpid. As Spring advanced (it was in 1831) the buds began to enlarge, the season became very favourable, showery and warm; and, strange as it may appear, both trees adapted themselves to the soil, developed their buds perfectly, and produced young shoots without the least appearance of debility. They continued to progress from year to year, have borne at least six crops of fruit, and are now large trees of admirable figure. Thus, *without any vestige of spongioles*, two trees in a then hopeless condition were planted, and have subsequently flourished, without (apparently) the loss of a month.

Another conclusive experiment may be adduced. It had been stated that moss-roses could not succeed in a certain locality. A set of plants was therefore bespoke of a party, not in regular trade, who had many, but who neglected to deliver them when taken up, and left them out of sight till May. At that time they were received, and every appearance of a single fibre had disappeared. Acting upon the principle that "Nothing is to be despaired of" (*Nil desperandum*), four or five tall suckers were most carefully planted in a strong sandy loam, and kept continually, but cautiously, supplied with water. Every one succeeded, and produced handsome self-standards, from which suckers were duly protruded, that supplied the garden, and the parents still live, and bloom in perfection.

Facts like these (and they cannot be contradicted) are decisive. They clearly prove that fibres, and especially Spongioles, are not required in the removal at a proper season (that is, in October, November, and February,) of deciduous trees and shrubs. Spongioles being then the organs of absorption connected with the young green parts, are vital to them, and thus it is we come to understand why it is that the removal of trees and shrubs during the seasons of growth is almost fatal to them; or at least invariably produces the collapse and fading of the Spring shoots, and also of green herbs at similar periods.

"The surface of the leaves," continues the Lecture, "is also capable of absorbing fluid, as we see when leaves which have become flaccid from drought are watered; the water penetrates the substance of the leaves, and restores their freshness."

This remark is only partially correct, and if flaccid leaves be ever restored, it is more than probable that the water enters and passes through the footstalk. We may water over the leaves in vain, if the soil be so dry as to cause flaccidity, and this proves that "the natural course of absorption is through the roots; the root of a plant continually increasing in length, and putting forth new branches, and going in search, as it were, of fresh nourishment. The chief elongation, however, is at the extremities. Each Spongiole is formed of a map of loose tissue uncovered by cuticle or epidermis; the cells of the Spongiole become after a time incapable of further absorption; new cells are formed, while the cuticle extends and covers the older ones; and thus the root increases in length." This passage may be said to comprise a pretty correct description of the progress of roots among plants of the deciduous tribes.

We must now take a glance at the absorbent system independent of roots already formed, and particularly at the development of roots from cuttings in water.

Dr. Ayres tells us (p. 93) in his Lecture that "The whole tissue of a plant is capable of absorbing liquids, for if we cut the branch of a tree or plant, and plunge the cut end in water, absorption goes on for a certain time, but soon ceases, because the cells are not renewed as in the Spongioles of the roots, and soon undergo changes by contact with water, which render them incapable of further absorption. The absorption may however be renewed, and the life of the branch prolonged by cutting off the end of the branch, and thus bringing a new surface in contact with the liquid.

"The cutting or slips of many plants are capable of producing fresh roots from their cut ends, provided the cutting be protected by covering it with a hand-glass, a flower-pot, or some other covering which will preserve the due moisture of the air around the plant, and thus preclude the necessity for a rapid absorption of liquid from the soil."

These are truths familiarly known to practical gardeners, many of whom are so adroit in the manipulation, that a failure is almost the exception to general success. We once saw, at a nursery near Holloway, a pit or two full of very small Camellias closely packed without an apparent interval. Not one of them appeared to have more than three leaves, and the number was estimated at 10,000. The soil was an inch or two of moist silver sand over a foot of decaying tan. Every plant had a system of beautifully white roots, which, to judge from a few specimens raised up, were larger than parts above the surface. The process commenced in September, and we saw the plants in the August following. There is reason to suppose that, were we experimentally acquainted with the required mode of treatment, every individual plant could be propagated by cuttings. The production of granular matter called *callus*, from the " cambium " or the " vital membrane " of the late Mr. Main, appears to be the *sine quâ non ;* and on this phenomenon rests the peculiar advantage of propagation by cuttings placed in a *phial* of water ; here the operator finds every opportunity to inspect and study the science of radification. He may not, perhaps, be enabled to detect the presence of those hidden agents which are stimulated by the vital principles ; but he certainly can observe the approaches of the first ring of granular matter *between* the wood and the bark, or of the more tender and green parts which represent those parts, and subsequently the advance of those protuberances which become the direct organs of absorption. Let *Gloxinia* be one of the first objects for experiments ; it will not fail to astonish and instruct. We hope to enlarge upon the subject in March.

CULTURAL HINTS ON SOME OF THE PLANTS BELONGING TO THE GENUS STATICE.*

LAST December we concluded our hints with some remarks on *Statice macrophylla,* and in returning to the subject, we may remark that the whole of the greenhouse species of this genus are very liable to be infested by and suffer much from attacks of insects of all kinds, among which the green-fly and thrips are not the least injurious. These, especially the first, may be removed by the usual method of fumigating with tobacco directly one insect can be discovered, and the same remedy will destroy the thrips, only the fumigation requires to be much stronger, and then there is a risk of injuring the tender foliage. To avoid the possibility of such an injury, it will be best when the plants are attacked by thrips to fumigate slightly on

* Continued from p. 258, vol. xiv.

several successive evenings, taking the precaution to remove the plants from the greenhouse, and to syringe them copiously both before and after they are fumigated. The thrips are cunning insects, and hence directly they perceive anything offensive in the atmosphere of the house, they jump from the plants, and burying themselves in the soil, remain there until the atmosphere is clear again, when they return to the plants and recommence the work of devastation. This is the reason why so much difficulty is experienced in clearing them from Vineries and other structures where the plants are permanent; but if, the same evening or the morning after fumigating, the walls, borders, and vacant parts of the houses are copiously syringed with water almost at the boiling point, much good will be effected. After the first brood of insects is destroyed, a quantity of eggs or young insects will be seen attached to the stronger part of the leaves, and these generally commence the work of destruction in from ten to fourteen days from the time of destroying the old brood. At this time, then, it will be necessary to fumigate again, observing the same precautions as before, and this will generally clear the plants for the season.

The brown scale and mealy bug also infest the *Statices*, and these must either be sponged from the Leaves, or " Hereman's Dilutium " must be used to destroy them.

Statice sinuata.—This, the Scollop-leaved Statice, is an herbaceous species, and was introduced from the Levant in 1629, and consequently is by no means a modern acquisition. The plant when well grown, or at least the flower-stems, attain an elevation of about three feet, and a well-grown specimen should be about the same in diameter. The flowers are blue and pale yellow, and are produced in great abundance from July until November. In cultivation, this species is increased by dividing the old plants early in February, potting them into small pots, and keeping them in a tolerably close but cool house or pit, until they get thoroughly established. When fine specimens of this species are wanted, it is not advisable to allow the plants to bloom the first season, and indeed when extra first-rate specimens are required, it is necessary to grow the plants through two seasons without permitting them to bloom, and then in the third year they will make magnificent plants. This species must be potted in the compost before recommended, using a little more nice turfy loam at each shift, and not shifting too largely at one time. A good specimen should be established in a 12-inch pot, before it is allowed to bloom. This *Statice* does not require so much heat to bring it to perfection as those previously noticed; neither will it need so much syringing and washing, as the foliage does not contract much of the glue-like covering before alluded to. During the growing season it must be kept in a warm but shaded part of the greenhouse, and be copiously supplied with weak manure-water; but through the winter it should be kept comparatively dry at the root.

Statice ritidophylla.—The rasp-leaved Statice has been in this country for some years; but the exact time of its introduction, or from whence it came, is not known. The species is commonly known in the nurseries as *S. Dicksonii* or *Dicksoniana* of the appendix of " Don's Catalogue." It produces fine pink flowers in large trusses, which are very beautiful, but generally it does not bloom quite so profusely as could be wished. It is readily propagated by cuttings, which root very freely in heat, and the plant during the growing season delights in a brisk moist stove temperature, and considerable bottom-heat, though the milder heat of the intermediate house is preferable for the preservation of the foliage. To get a really good specimen of this plant, it is necessary to stop the young shoots regularly until the pot is quite covered with branches, as, if left to itself, it grows very loosely, and soon becomes unsightly. After a proper foundation has been laid, the branches may be allowed to extend to the length of two feet, and if the wood is properly matured, and the plants are kept in a dormant state through the winter, they will generally, when introduced into heat in the following spring, produce a good head of bloom. Occasionally a strong plant with four or five branches, may be met with in the Nurseries, and such a plant, if well-rooted, may be cut down to within four or six inches of the pot, and if placed on a gentle bottom-heat, will produce abundance of shoots. When the young shoots are an inch or two long, the plant, if in a large pot, must be shaken out, or have the ball so much reduced, as to admit of its being placed in a small pot. Use the compost before recommended, adding a little additional peat and silver sand the first time of potting; place the plant in a gentle moist heat until thoroughly established, and then treat it the same, as to temperature, as *S. arborea*. This species requires much washing over the foliage with a sponge, and when growing freely delights in abundance of clear weak manure-water.

Statice purpurata.—The Purple Statice requires the same treatment as the preceding, and though dull-coloured, is distinct and interesting. It does not require so much heat, as it is from the Cape of Good Hope; but it delights in a moist growing atmosphere with abundance of air. Use the same compost with a little additional peat, and give plenty of manure-water.

Statice mucronata.—The pointed and curled Statice is a well-known species, and was introduced from Barbary in 1784. It produces pale red flowers in great abundance, which continue a long time in perfection, and the plant is one of very easy management. Some good plants of this kind may be seen in the garden of the Horticultural Society, but by proper attention this plant might be grown to a very considerable size, indeed almost to any size; and yet, in ordinary collections, we rarely see it more than a foot or eighteen inches high, and then by no means so bushy as it ought to be. The best way to proceed with this species, is to procure a nice bushy plant, say in a 6-inch pot. After Christmas introduce it into the heat of an intermediate house, and as soon as it begins to grow and root freely, remove it into a 9-inch pot, using the same compost as for the other species, and syringing copiously. Treat the plant the same as *S. arborea*, and shift it as frequently as appears necessary, until September, when it must be ripened off. If a fine specimen is a desideratum, it is not advisable to allow the plant to bloom the first season; but if, on introducing the plant into heat in the spring of the second year, each of the principal leading shoots is stopped by pinching out the terminal bud, they will form abundance of shoots, and a splendid head of flowers. This Statice is propagated freely by cuttings of the young shoots in a close gentle heat; and it also produces seed, from which it may be increased in great abundance.

Statice puberula, the puberulous Sea-Lavender, is one of Mr. Webb's acquisitions from the Canaries, and is marked, in the last edition of the "Hortus Cantabrigiensis," as being hardy. This, however, must be an error, as we have always found a slight frost injurious to it; but very likely in the south of Devonshire or Cornwall, when well ripened or in a stinted state, it might resist the winters of that part of the country. *S. puberula* is a compact, dwarf-growing, small-leaved species, which forms a very neat specimen, producing abundance of purple and pale-yellow or straw-coloured flowers. In cultivation it requires a more porous soil than some of the stronger-growing species, and hence sandy, turfy peat must be substituted for some of the loam in the compost. For the same reason, it must not be shifted too heavily at one time; neither must it, during the dormant season, be too freely supplied with water. Small plants should be started in January, in the intermediate house, syringing them copiously every day during the growing season, and taking care to remove the gummy exudation, which is found in abundance on this plant at least every week or ten days. Pot the plants as often as necessary, and remove the flower-buds as fast as they appear during the first season. This species is propagated by cuttings of the young wood, which strike rather tardily in a gentle heat.

Statice imbricata, the imbricated Sea-Lavender, is another of Mr. Webb's plants from Teneriffe, and was introduced in 1819, but afterwards lost. It has been reintroduced through the same gentleman to one of the French nurserymen, and the writer has the authority of a very competent judge, who saw it blooming near Paris, for saying it is perhaps the finest Statice in cultivation. It is marked in the book before quoted as being a hardy plant; but as most of the London nurserymen are treating it as a warm greenhouse plant, which treatment appears to agree with it admirably, we may conclude that the Cambridge catalogue is wrong again. Small plants of this Statice resemble *S. sinuata* very much in general appearance, but on close inspection the "scollops" of the leaves are more obtuse, the foliage is considerably stronger, and the plant is said to be a shrubby species. The drawings sent from France shew it to have very beautiful blue and white flowers, of considerable size, and the flower-stems appear to attain a height of from eighteen inches to two feet. It will require the same treatment as *S. arborea* as to temperature and potting, and it will doubtless prove a very interesting and valuable plant. It may be propagated by cuttings, and also by division of the young plants.

Statice Fortuni is one of Mr. Fortune's introductions from Chinchin, in China, where it was "found growing in sandy soil near the sea." It is a perennial plant, and the flower-stems in their wild state are not more than eight or nine inches high, but when the plant is grown in a greenhouse, they become from two to three feet in height. The flowers, which are bright pale-yellow, are produced very abundantly; and in the "Journal of the Horticultural Society" vol. i., p. 70, Dr. Lindley states that "it will probably prove hardy, and if so, will be very suitable for bedding out in the flower-garden." This is a very distinct and pretty species, and if it can be grown so as not to exceed a foot in height, it will prove, in consequence of its colour, a great acquisition to our collections of Statices. "When grown in pots or frames, it becomes drawn and unsightly; but if planted out in sandy peat, it does not seem to grow above a foot high." We have not tried this plant in the open border, and therefore cannot speak as to how it is likely to answer; but if it should be hardy, and not exceed a foot or eighteen inches in height, it will doubtless prove a valuable plant for the autumn flower-garden. As a greenhouse plant it requires the same treatment as *S. sinuata*, but when the flower-stems begin to appear, it should be placed in the open air, and there remain until it is in bloom. It is freely propagated by seed, and also by cuttings or division of the plants.

Statice eximia is another species, with diminutive pale pink flowers, introduced, if we are rightly informed, by Mr. Fortune; at least we received it from the garden of the Horticultural Society two years back, with some more of Mr. Fortune's plants. This species has also the fault of growing too tall when cultivated as a greenhouse plant, and hitherto has proved a shy bloomer. Whether, when planted out, it will be more compact, time only can demonstrate.

The preceding may be considered the best of the tender Statices, and as they are very dissimilar and distinct in habit, as well as in character and colour of flowers, they will prove a very interesting group of plants for the greenhouse of amateurs, more especially as they are of easy cultivation, and continue for a long time in perfection. In the southern counties of England they would doubtless grow admirably when planted out in the summer season, and a group containing the preceding species all blooming together would present a very chaste and beautiful appearance. In planting them out, the ground should be well drained and properly prepared as to porosity, so as to insure the plants from being injured by stagnant water. We should not recommend it to be rich, but would trust to liquid manure for a stimulant when necessary.

In these days of hybridising and cross-breeding, when many of our old friends are disappearing from cultivation, and being replaced by new varieties, manufactured as it were by the magic of the *florist*, it is singular that no person has directed his attention to the improvement of the Statices. To ring the changes, as it were, between *S. ritidophylla* and *arborea*, to transfer the pink flowers of the one for the blue flowers of the other, and *vice versâ*, would appear to be a task not more difficult of accomplishment than many which have been performed; and at any rate, to work the larger and brighter coloured flowers of the species from the southern hemisphere on the small-flowered inhabitants of northern climes, is an achievement worth working for, and one which would reward the enterprise of any amateur or florist who might undertake it.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED AND DESCRIBED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER.

ANEMONE JAPONICA. A native of damp woods on a mountain called Kijune, near Miako, in Japan, and was introduced to this country by Mr. Fortune.—*Bot. Mag.*, 4341. For the particulars of this beautiful hardy plant, refer to *Mag. Botany*, vol. xiii., p. 20, and vol. xiv., t. 25.

BOLBOPHYLLUM HIRTUM. This curious plant has flowered with Messrs. Loddiges. It produces a long drooping tail of small whitish flowers, having exactly the smell of Sweet Vernal Grass (*Anthoxanthum odoratum*). The sepals are thickly clothed with hairs, and have numerous purple oblong glands, especially on the edges. It is a native of the East Indies, where it grows on trees.—*Bot. Reg.*, 66.

BROWALLIA SPECIOSA. This new species of Browallia was discovered in the mountains of Tolima and Quindiu, by Mr. Purdie. The flowers are a deep purple, thrice the size of those of *B. grandiflora.*—*Bot. Mag.*, 4339.

CHÆNESTES LANCEOLATA. The seeds of a fine flowering specimen of this were sent by Mr. Purdie from the mountains of Quindiu, marked "a very beautiful shrub;" and so it has proved. The young plants grew rapidly, and were planted out against a wall in the Royal Gardens, in the summer of 1847, where they blossomed and continued to produce their umbels of rich deep blue flowers till the cold of autumn injured them.—*Bot. Mag.*, 4338.

CYMBIDIUM EBURNEUM. The flowers of this charming East Indian Orchid are not only among the largest of the genus, but among the sweetest. They resemble, in fragrance, those of the Chinese Cymbid, than which nothing is more delicious; and not a spot interferes with the pure ivory-white petals, except one long yellow stripe along the middle of the lip.—*Bot. Reg.*, 67.

EXACUM TETRAGONUM BICOLOR. An East Indian plant, found by J. E. Law, Esq., growing profusely in the Coucan among long grass. The blossoms are highly ornamental, but as the plant is annual, it may prove difficult in some seasons to ripen the seeds. The flowers are produced in a cyme or panicle, and are purple and white.—*Bot. Mag.*, 4340.

GARDENIA NITIDA. This is a perfectly new and most distinct species, possessing handsome, dark-green, glossy foliage; flowers, among the larger of the genus, deliciously scented: the corolla is of the purest white, and the plant deserves a place in every stove.—*Bot. Mag.*, 4343.

GESNERIA TRIFLORA. Tubers of this *Gesneria* were sent from New Grenada by Mr. Purdie, and flowering plants were in perfection in the Royal Gardens in the summer of 1847, continuing a long time in blossom. The flowers are by no means so copious as in the *G. Hondensis*, to which the species is in some respects allied; but the corollas, and foliage too, are larger.—*Bot. Mag.*, 4342.

GONGORA MACULATA TRICOLOR. A most beautiful variety of *G. maculata*. The ground colour of every part of the flower, except the lip, is clear yellow; the column and petals are delicately banded with rich sienna brown, and a few large clear distinct blotches of the same colour occur on the sepals. The lip itself is white, with a cinnamon stain on the ends of the lateral tubercles, and the sides of its upper half.—*Bot. Reg.*, 69.

MALACHADENIA CLAVATA. A Rio plant, in the collection of Mr. Bateman, where it bloomed first in 1839. It is very singular, though it has little beauty to recommend it; and Mr. Bateman remarks, that it is the only Epiphital Orchideous plant known, which emits a positive stench, and that too at all hours, by night and day. In the stove it resembles the foulest carrion.—*Bot. Mag.*, 4334.

ODONTOGLOSSUM (*Leucochilum*) MAXILLARE. A new Orchid, which might, when in flower, be mistaken at first sight for *O. Cervantesii.* It is, however, readily known by its wingless column, and especially by the presence of a large yellow appendage, seated at the base of the lip, and scarcely shorter than the column. It is probably a native of Mexico.—*Bot. Reg.*, 62.

ONCIDIUM AMICTUM. A native of Brazil, whence it was received by Messrs. Loddiges, with whom it flowered in April, 1847. Its large yellow flowers, more or less spotted in many parts with rich brown, give it a very handsome appearance.—*Bot. Reg.*, 66.

Oncidium curtum. At first sight this species looks like *O. crispum* or *Forbesii*, but in reality it is much nearer *O. pectorale*, but the flowers are smaller; there is more brown in the sepals and petals; there is also a broad brown border to the lip.—*Bot. Reg.*, 68.

Oncidium pelicanum. This plant is very closely akin to *O. reflexum*, from which it differs principally in the sepals and petals being less blotched, in the lateral lobes of the lip being smaller in proportion to the intermediate segment, and in the tubercles of the crest, which is smooth not downy, and being rather differently arranged.—*Bot. Reg.*, 70.

Rhododendron Javanicum. An introduction of Messrs. Veitch and Sons, and certainly one of the finest things ever introduced to our gardens. The flowers are rich orange colour, twelve on a bunch. It succeeds well under the mere shelter of a greenhouse, and will probably blossom all the year round. It is a native of Java.—*Bot. Mag.*, 4336.

Stenorhynchus cinnabarinus. This rare Orchid was introduced from Mexico by Messrs. Loddiges. The dull olive-green of the bracts belonging to its large compact spike, the vermilion red of the flowers externally, and the bright yellow of the inner face of their narrow spreading points, give them an appearance unusually gay among terrestrial species.—*Bot. Reg.*, 65.

Thibaudia Pinchinchensis glabra. This kind is eminently beautiful, with its bright green, rather ample foliage, and flowers larger than, and as waxy as those of the Heath, and of a deep rose red.—*Bot. Mag.*, 4344.

Tritonia aurea. This beautiful plant is a native of Caffraria, whence it was brought by Mr. James Backhouse, the eminent nurseryman at York. It is certainly a very fine plant, remarkable for the rich apricot colour of its large *Ixia*-like flowers, and for the abundance with which they are produced. It seems easy of cultivation, and a profuse flowerer, remaining a long time in great beauty. A bed of it would be a far more striking object than the gaudy *Gladiolus psittacinus;* for the colour of the blossom is much more brilliant, and for such a purpose it will prove a great acquisition.—*Bot. Reg.*, 61; *Bot. Mag.*, 4335.

Tropæolum umbellatum. One of the most remarkable of all the *Tropœola*, which have been characterised as bearing one-flowered peduncles; here the flowers are umbellate, of a rich orange-red colour, tinged with green, and so copious as quite to overpower the foliage. It was introduced by Messrs. Veitch and Sons, through their collector, Mr. W. Lobb.—*Bot. Mag.*, 4337.

Vanda tricolor.—This fine Javanese species has been brought into cultivation by Messrs. Veitch. It has the habit of *Vanda Roxburghii*, and its flowers appear in the same manner, but they are larger, have yellow and brown spotted sepals, and a rose-coloured lip, with the lateral lobes rounded, not acute, and colourless.—*Bot. Reg.*, 59, *descrip.*

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Achimenes spe. nov. In the nursery of Messrs. Knight and Perry has recently flowered a novel species of Achimenes, having terminal as well as lateral branches of bright scarlet blossoms, each about an inch long. The foliage is of moderate size, and a rich green on the upper side, paler beneath, hairy and deeply serrated at the edges. The stem is reddish, slender, and covered with short hairs. The species promises to be a prolific bloomer.

Begonia insignis has a most graceful manner of flowering, having a long pendant flower-stem, with upwards of ten delicate blush-coloured flowers. The foliage small, and a bright green colour.

Begonia rupestris. This species has very large and pure white flowers, made still more attractive by the very bright yellow of the anthers, and the large white bracts on the stem. The foliage is long and narrow, dark green spotted with white on the upper side, while the under side is dark chocolate. This, as well as the former species, we found flowering freely in the nursery of Messrs. Rollisson, Tooting.

Dombeya erythroxylon. An ornamental species, having beautiful white flowers, about two inches in diameter, the stamens and anthers being of a dark chocolate and bright-yellow colour. The habit good and neat; foliage a deep bright green, edged with a paler colour, which extends beneath the leaf. The stems are a rusty brown. We noticed this plant in the stove of Messrs. Rollisson, Tooting.

Fuchsia dependens. Recently we were favoured with a specimen of the above from Messrs.

Veitch and Sons, Exeter. It is somewhat like *F. fulgens* in flower and colour, though in the manner of producing them widely different. At the axils of the leaves, which are in fours at a joint, the flower-stems are sent out horizontally, seven or eight inches long, at the end of which are several leaf-like bracts, out of which the flowers are produced, hanging down in bunches; and these, rising tier above tier, give the plant an unique as well as graceful appearance.

Gardenia Sherbourni. Messrs. Knight and Perry have recently had this pretty flowered *Gardenia* in bloom; it has long been known from its beautiful habit as a creeper, but its qualities as a free bloomer are anything but favourable. The flower is about two inches long, and expands to about an inch-and-a-half, pure white, with a rich flesh-colour covering the interior of the tube: it possesses a rich odour, and lasts several days in good perfection.

Gesnera Hondensis. We found several seedling varieties of this species in good flower in the nursery of Mr. Glendinning, Chiswick. The specimens were about ten inches high, producing their flowers rather abundantly, as many as eight or ten at the axils. The flower is an inch long, orange, but being covered with long hair of a crimson colour gives the flower a rich scarlet tint. The leaves are long and narrow, serrated, and dark green, paler at the back, clothed with downy hairs, stem and peduncles likewise. The stem is slightly tinged with a purplish colour. On the whole, we think it a desirable plant for winter culture to those possessing a stove.

Hindsia spe. nov. At the last Horticultural Meeting at the rooms, Regent Street, Messrs. Veitch and Sons exhibited a new species of Hindsia, and from the season at which it flowers it will be a very serviceable plant, more particularly as it requires but the shelter of an ordinary greenhouse. The plant forms a dwarf bush six or eight inches high, with neat and bright green foliage, flowers terminal, in bunches of four or more blooms of a reddish-lilac colour about an inch long and produced freely all over the plant.

Jasminum nudiflorum. We noticed this plant flowering in the open air on a wall, slightly protected by a projecting straw roof in the Gardens of the Horticultural Society, Chiswick. The plant produces a plentiful supply of pale-yellow blossoms, without foliage or (as far as we could judge) any fragrance. The species was one of the introductions of Mr. Fortune, from China, and highly deserving a place in every garden.

Leucopogon juniperoides. This species we noticed in flower and coming into flower in great profusion in the nursery of Messrs. Henderson, Pine Apple Place. Its flowers are minute representations of the Epacris, of a delicate pink colour, and produced in clusters at the axils and tip of the shoots; this, allied to a neat habit with linear-like foliage, will make the species deservedly a favourite.

Luculia gratissima. We cannot avoid some mention of this truly splendid specimen, now in gorgeous condition of flower at Chiswick, in the Conservatory of the Horticultural Society. The specimen is more than six feet high and nearly the same in width, covered with its large bunches of highly fragrant blooms, many of the bunches being ten inches in diameter, and flowering from branches almost close to the ground. From the free manner in which this specimen grows and blooms, we feel surprised we do not more often see it elsewhere, and we are not aware that any particular method of cultivation is resorted to, more than being planted out in the border, and left to pursue its course unchecked. Certainly there is not a more handsome or desirable plant to be had for the purpose of turning out in the border, as it continues in flower for three or four months during the winter.

Salvia oppositiflora. Some time since we received a specimen of the above from Messrs. Veitch and Sons, Exeter, having long racemes of orange-coloured flowers, hardy, and growing about two feet high, sending out laterals covered with flowers all the way up the stem. Neat and a good green foliage, will make it a very useful plant for the border.

OPERATIONS FOR FEBRUARY.

Business amongst flowering plants is now rapidly on the increase; every day brings to light new duties, and recals to mind others which may have been neglected, but which must have immediate attention. The sun's rays begin now to have considerable power; a proportional increase of heat may be allowed in the stove and Orchid-house, and also a larger quantity of air may be admitted; be careful, however, that no means are used to excite, for the present, those plants which are at rest. Orchid potting should now proceed as rapidly as possible. By the introduction of new soil and sphagnum, it is almost certain that many slugs will harbour in them, and pass unnoticed into the house; to prevent their depredations, all the vigilance of an enthusiast must be employed: if any damage is perceived, immediately place traps in different parts of the house—slices of turnip, cabbage-leaves, apples, parsnips, or any other article that would be likely to entice them, and if these are carefully examined once or twice during the night, all the slugs will soon be collected.

Achimenes grandiflora, longiflora, multiflora, pedunculata, and all the other species and varieties, should now be brought from their winter-quarters and potted: give good drainage and plenty of pot-room, with the exception of *A. multiflora,* which is so impatient of moisture that it is always advisable to keep it rather cramped than otherwise; sandy loam, peat, and one-half leaf-mould, is the proper soil. *Gloxinia digitaliflora, Passinghamii, rubra, Fyfiana,* and other kinds, should also have the same treatment. *Gesneras* must likewise have similar attention paid to them.

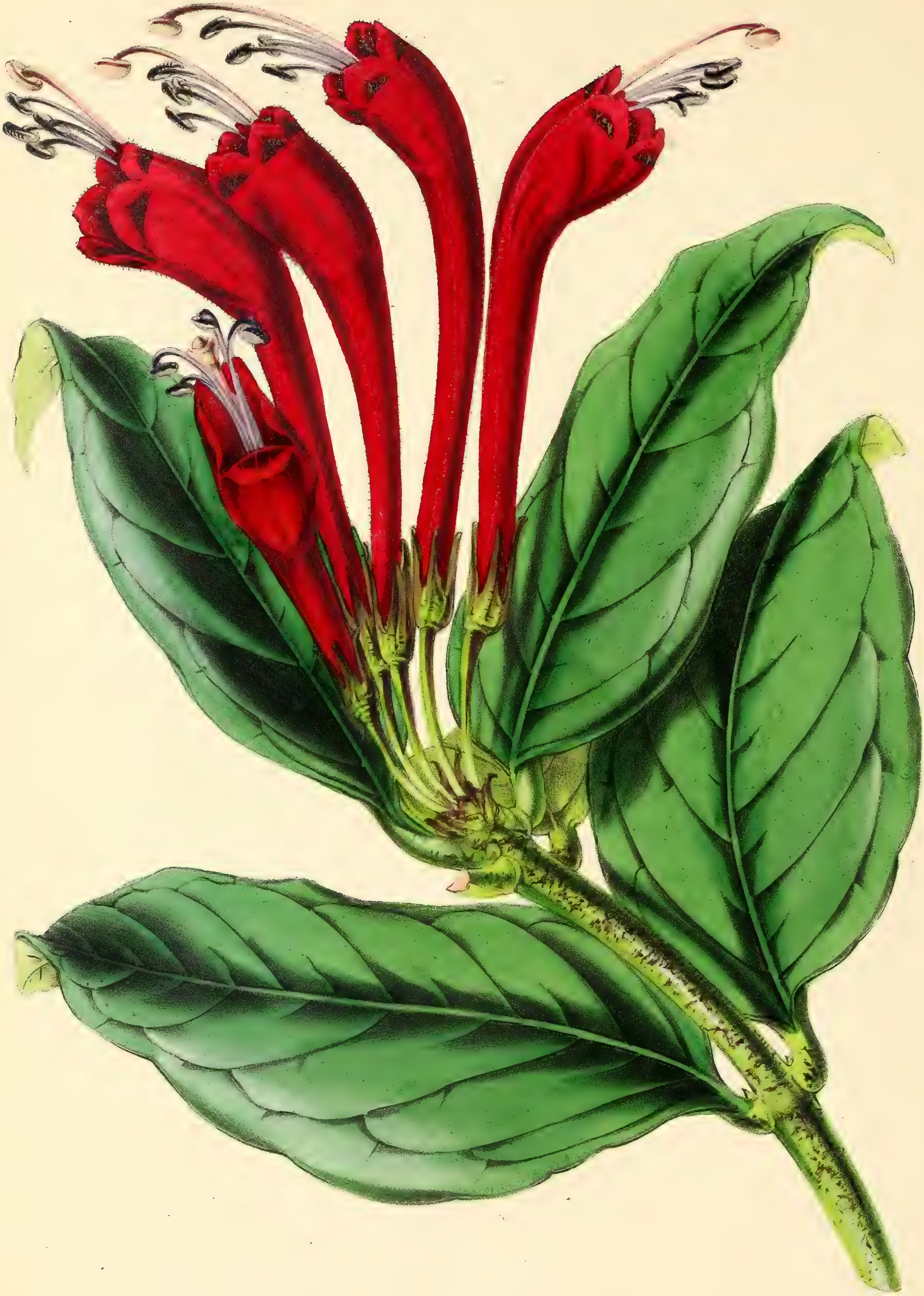
Stove creepers, as the tuberous-rooted *Ipomœas, Echitis, Stephanotis,* and *Pergularias,* should now all be re-potted, cut in, and started in a moderate bottom-heat; be particularly careful not to over-water until the plants have got into a vigorous growth. Many persons follow the practice of plunging them; perhaps it is far safer to set them on the top of a bed where there is a brisk moist bottom heat.

In the greenhouse and conservatory, climbers, as *Passiflora incarnata, Mooreana, cæruleo-racemosa,* and *alato-cærulea; Zichyas* of various kinds, *Kennedyas,* and others, should now be trimmed and tied in, previous to their beginning to grow. *Fuchsias* of choice kinds, intended for specimen plants, should also be started into growth: as they grow, train a leading shoot up from each, so as to allow the side shoots to hang carelessly and form a pyramid of flowers. The China roses of various kinds are now beautifully in flower, and repay all the trouble of forcing: a little manure-water, made very weak, and administered two or three times a week, will give them vigour, and brightness in the colour of the flowers. *Pelargoniums, Calceolarias,* and *Cinerarias,* that are now showing signs of flowering, should be potted without delay; be particularly careful not to damage the roots, or the flowers will not expand with the same vigour. *Camellias,* that were brought into flower early, will some of them be now out of bloom: where this is the case, repot and remove them to an increased heat, for growth and the formation of their flowering buds. Tender annuals should also be sown; amongst which do not forget *Martynia fragrans, Dysophylla stellata, Campanula sylvatica, Scypanthus elegans, Torenia scabra, Lobelia heterophylla major, Brachycoma iberidifolia, Eustoma exaltatum,* and *Martynia lutea.*

In pits and frames, look well to the plants which are intended to occupy the flower-garden: keep them clean, and give as much exposure as the weather will admit of. Amongst other kinds, do not forget *Plumbago Larpentæ, Phlox Leopoldiana, Hydrolea spinosa, Stachys coccinea,* and *Scutellaria japonica.*

In the forcing pit, Lilacs, Roses, Hyacinths, and other plants whose flowers are expanding, remove to a cooler temperature, and replace with others.

In the open air, proceed with everything as fast as the weather will permit: especially, make edgings to walks; prepare the flower-borders for the purposes to which they are destined; plant shrubs and trees for ornament; prune Roses and other plants; make and repair walks, and pot plants for forcing next winter, as Lilacs, Roses, &c.; indeed at this time of the year both the eyes, the head, and the hands of every cultivator should be busily engaged, every fine day especially.



S. Holden. del & Lith

Æschynanthus longiflorus.

ÆSCHYNÁNTHUS LONGIFLÒRUS.

(Long-flowered Æschinanthus.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.
(Gesnerworts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* ventricosely tubular, five-cleft. *Corolla* tubular, incurved, with a dilated campanulate throat, and an oblique, sub-labiate limb. *Stamens* four, didynamous, exserted, usually with the rudiment of a fifth; *anthers* at first conniving by pairs; *cells* parallel. *Stigma* excavated, somewhat funnel-shaped. *Capsule* long, siliquose, two-valved, falsely four-celled. *Seeds* small, generally scabrous, from papillæ ending in a bristle-like tail at both ends.—*Mag. Bot.*, vol. xiv., t. 199.

SPECIFIC CHARACTER.—*Plant* epiphytal, evergreen. *Stems* trailing, somewhat robust, rooting at the joints. *Leaves* opposite, broadly-lanceolate, long-acuminated, fleshy, entire, smooth, somewhat large. *Petiole* short. *Flowers* disposed in terminal fascicles, ten or twelve flowers in a fascicle, peduncled. *Peduncle* short, single-flowered. *Calyx* tubular, smooth, green, tinged with purple, deeply cut into five linear-subulate segments. *Corolla* tubular, nearly four inches long, deep crimson; the tube clavate, and curved at the extremity; *limb* divided into four rounded segments, the upper one bifid: each segment bears an irregular black band; *mouth* contracted and yellow, with dashes of a deeper colour. *Stamens* exserted. *Anthers* joined in two pairs. *Style* shorter than the stamens, hardly extending beyond the mouth of the tube. *Stigma* transversely grooved.

AUTHORITIES AND SYNONYMES.—Æschynanthus, *Jack*, in *Linn. Trans.*, *Wallich*, in *Pl. var. Asiat.* Incarvillia, *Roxburgh*. Lysionotus, *Blume*, in *Bijdragen tot de flora var. Nederlandshe Indie.* Æ. longiflorus, *Hooker* in *Bot. Mag.*, t. 4328. *Blume*, in De Candolle's *Prodromus*, *Mag. Bot.*, vol. xiv., p. 190. Lysionotus longiflorus, *Blume Bijdr.* *G. Don*, in *System of Botany*.

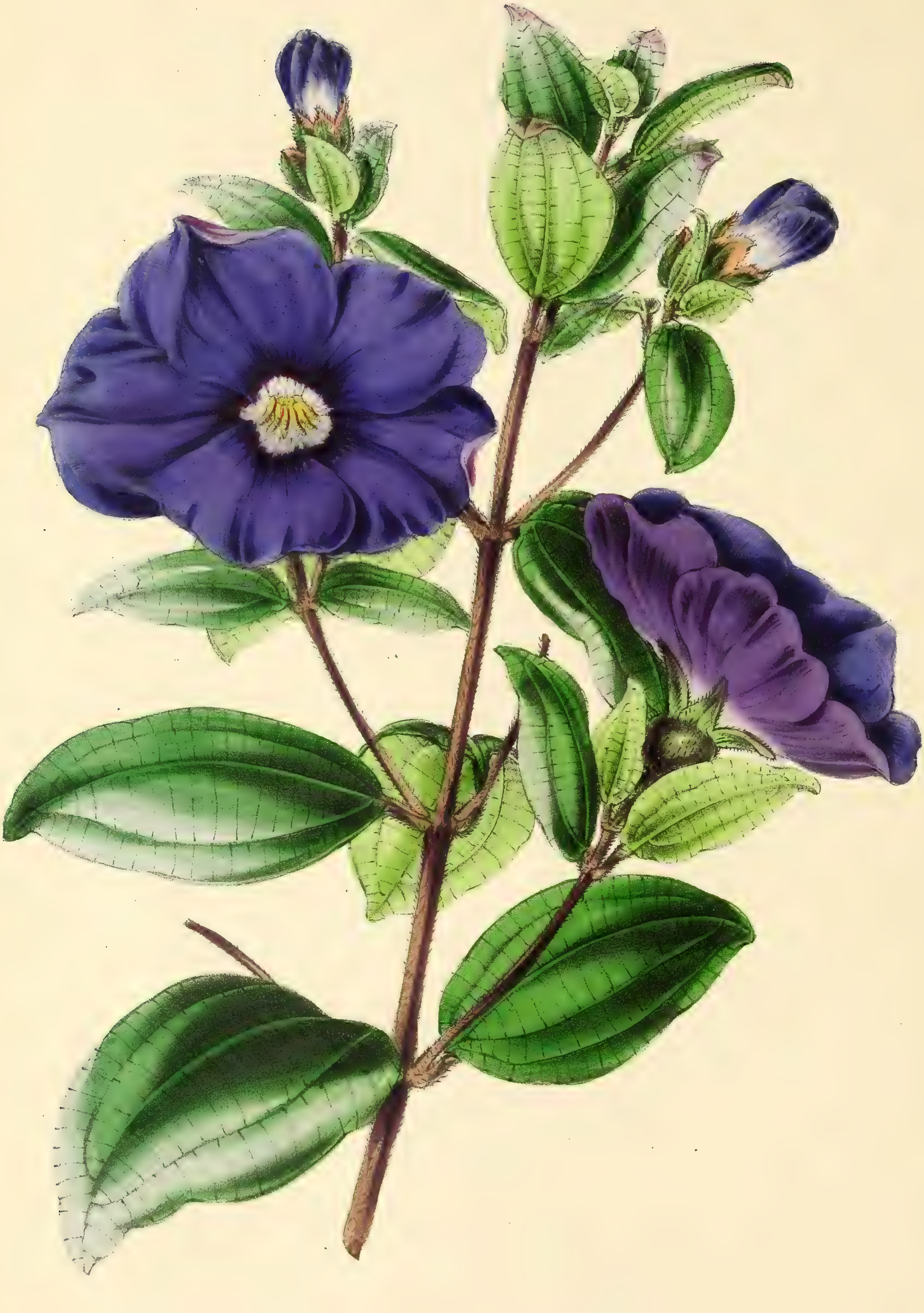
IN our Magazine of Botany, vol. xiv., t. 199, we figured a splendid species of *Æschynanthus* (*Æ. speciosus*), introduced by Messrs. Veitch and Son, nurserymen of Exeter; we now bring before our readers another, and perhaps a still more gorgeous one, introduced into this country by the same gentlemen, and which proves to be the true *Æ. longiflorus.* They received plants of it from Mr. Thomas Lobb, their collector at Java, under the name of *Lysionotus longiflorus*, and by which appellation it was, some years ago, recorded as growing plentifully in dense woods in the provinces of Tjanjor, Buitenzorg, and Bantam, chiefly inhabiting old trees.

It is described by Mr. Lobb as growing one foot high, in dwarf forests, on trees at an elevation of from three to four thousand feet. Messrs. Veitch treat it as a stove plant, and find it of easy culture. The flowers are produced freely all over the plant in terminal clusters of eight or ten, averaging about five inches in length, and of a deep puce or rich crimson scarlet colour.

Our drawing of this splendid acquisition was made from a plant which flowered in the collection of Messrs. Veitch, in August, 1847.

For its culture, propagation, and other particulars, reference may be made to our remarks on *Æ. speciosus*, Magazine of Botany, vol. xiv., t. 199.

The generic name is derived from *aischuno*, to be ashamed, and *anthos*, a flower, in allusion to the plants always flowering in shady situations.



S. H. del. et lith.

Pleroma elegans.

PLERÒMA ÉLEGANS.

(Elegant Pleroma.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
MELASTOMACEÆ.
(Melastomads, *Veg. King.*)

Generic Character.—*Calyx* with an ovate tube; when young involved in two deciduous bracts; lobes five, deciduous. *Petals* five, obcordate. *Stamens* ten. *Filaments* pilose or glabrous. *Anthers* elongated, arched at the base, having their connectives stipe-formed, and furnished with two short auricles at the base. *Ovary* adhering to the calyx, apex bristly. *Capsule* baccate, rather dry, four or five-celled. *Seeds* cochleate.

Specific Character.—*Plant* an evergreen shrub, growing six feet high. *Branches* opposite, erect, scabrous from numerous closely-pressed bristly hairs. *Leaves* opposite, petiolate, nearly elliptical, acute, five-nerved, three inner ones prominent, two outer ones near the margin less distinct, sometimes almost obsolete, quite entire, smooth, glossy, and of a deep rich green above, but pale beneath, and covered with numerous white closely pressed hairs; margins ciliated. *Petioles* short, fleshy, scabrous. *Flowers* terminal, solitary. *Pedicels* short, and generally with two small leaves. *Tube of calyx* globose, beset with stiff bristles, and having immediately at the base two or three large coloured deciduous bracts; segments of calyx five, deciduous. *Petals* five, smooth, very blunt. *Stamens* ten. *Filaments* awl-shaped, covered with scattered hairs. *Anthers* sickle-shaped. *Style* smooth. *Ovary* joined to the calyx-tube, hispid.

Authorities and Synonymes.—Pleroma, *De Candolle, Prodr. D. Don*, in *Wer. Soc.* Melastoma of *various Botanists.* P. elegans, *Gardner*, in *Hooker's London Journal of Botany. Hooker*, in *Bot. Mag.*, t. 4262.

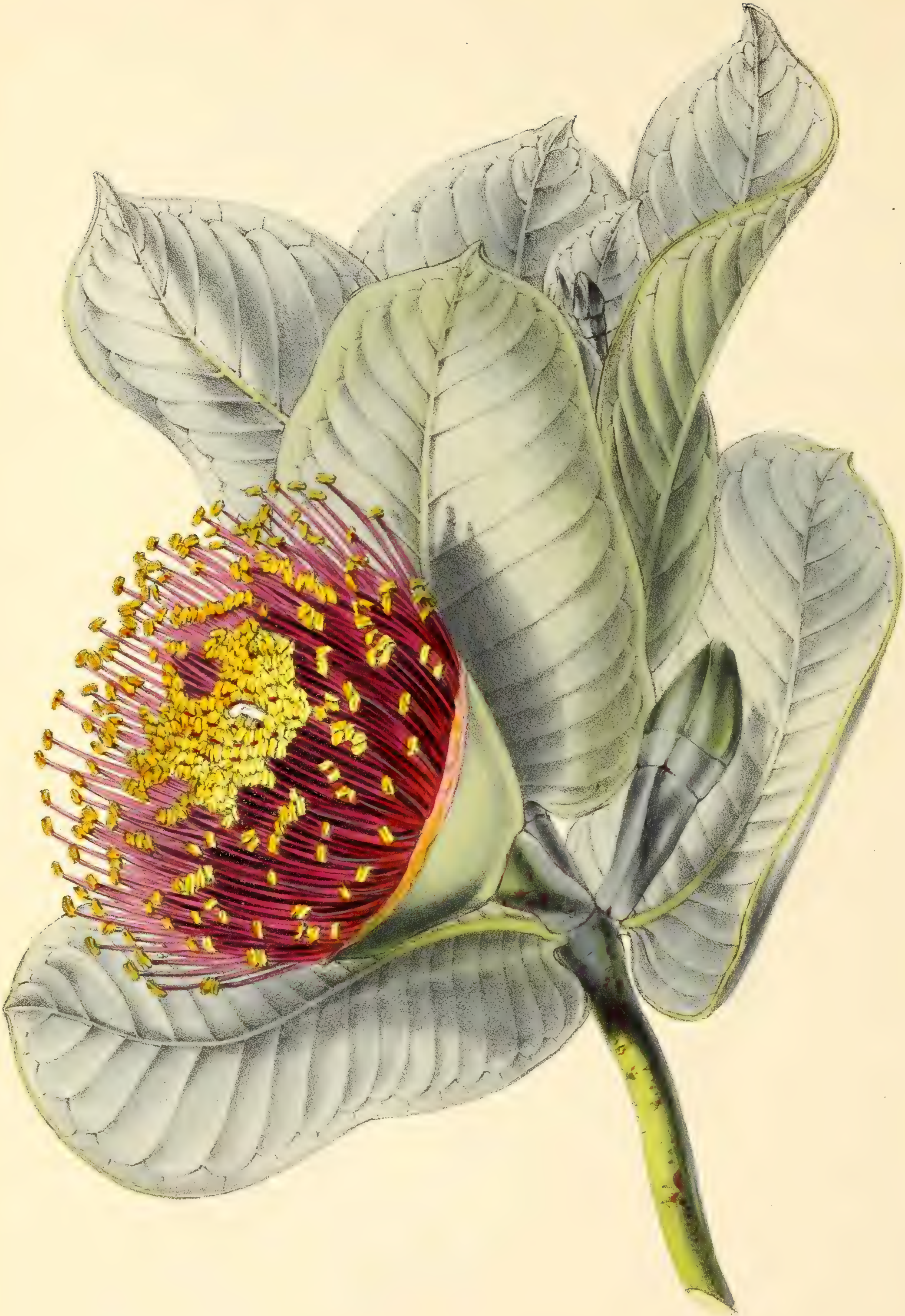
Perhaps a more appropriate title than *elegans* could scarcely have been given to this very elegant plant, which possesses some valuable properties not altogether common to the genus; first, it is of a very dwarf and slender habit, forming quite a low broad-spreading shrub; the foliage is small, neat, and of a bright glossy green; the flowers are large in proportion to the foliage, and of the richest purple, rendering the plant when in bloom exquisitely beautiful, almost surpassing the splendid *P. Kunthiana*, figured in our Magazine, vol. xii., t. 125; and last but not least, the blossoms are not fugitive, but continue in perfection longer than almost any other species.

It is a native of the Organ Mountains of Brazil, where it was originally discovered by Mr. Gardner, growing at an elevation of 4500 feet, and who had the honour of first describing and bringing it under the notice of botanists. It has since been sent by Mr. William Lobb, from the same locality, to Messrs. Veitch and Son, in whose nursery, at Exeter, it flowered in August, 1847, when our drawing was kindly permitted to be made.

Like the other species of *Pleroma*, it requires to be potted in a mixture of loam, peat, and sand, and to have the temperature of a moist stove.

It increases without difficulty by cuttings of the young wood, planted in pots of peat soil, and placed in heat with a hand-glass over them.

The generic name is derived from *pleroma*, fullness, in allusion to the cells of the capsules.



S. H. del et lith.

Eucalyptus macrocarpa.

EUCALÝPTUS MACROCÀRPA.

(Large-fruited Gum Tree.)

Class.
ICOSANDRIA.

Order.
MONOGYNIA.

Natural Order.
MYRTÀCEÆ.
(Myrtle-blooms, *Veg. King.*)

Generic Character.—*Calyx-tube* persistent, obovate, sometimes like a round cup; limb in the form of a lid, entire, separating transversely at the base from the tube, deciduous. *Petals* none. *Stamens* numerous; filaments free. *Ovary* four or five-celled; ovules many. *Capsule* four-celled, sometimes only three-celled from abortion, opening at the top. *Seeds* many.

Specific Character.—*Plant* a shrub, everywhere covered with a glaucous-white pulverulent substance. Young *branches* four-sided. *Leaves* numerous, opposite, large, three to four inches long, elliptical-ovate or cordate, sessile, and half embracing the stem, coriaceous, acuminulate, margined, penni-nerved, the nerves very patent, rather crowded, parallel. *Flowers* axillary, solitary, nearly sessile. *Calyx-tube* sub-hemispherical, but tapering; the free portion united into a hemispherical acuminate *lid*, which separates transversely from the very thick *tube*. *Stamens* exceedingly numerous. *Filaments* long, subulate, deep rich red; the central ones spreading. *Anthers* yellow. *Style* subulate. *Fruit* very large, orbicular, a depressed hemisphere, very woody, opening in the middle by four or five valves. *Hooker*, in *Bot. Mag.*, t. 4333.

Authorities and Synonymes.—Eucalyptus, *L'Heritier, De Candolle.* Eucalyptus macrocarpa, *Hooker,* in *Icones Plantarum*, 405-6-7. *Bot. Mag.*, 4333. *Lehmann Plant. Preiss.* 132.

The species of *Eucalyptus* are numerous; it is stated that there are one hundred or more found in New Holland and other parts of Australia, some of which are the loftiest trees in those southern forests. (Magazine of Botany, vol. x., t. 213.) Not more however than sixty of these have been yet described, and some only imperfectly from mutilated dried specimens.

Our present species is behind none of them for beauty; its leaves are large, spreading, and thickly disposed on the branches; they are covered both on the upper and under surface with a bluish-white powder, which renders them of a peculiar glaucous colour. The flowers are large, and of so bright a red, that they form a striking contrast with the pale colour of the leaves. In its native country, from the loftiness of its growth, the bluish-white colour of the leaves, and the fine red of the flowers, it must prove a very striking object.

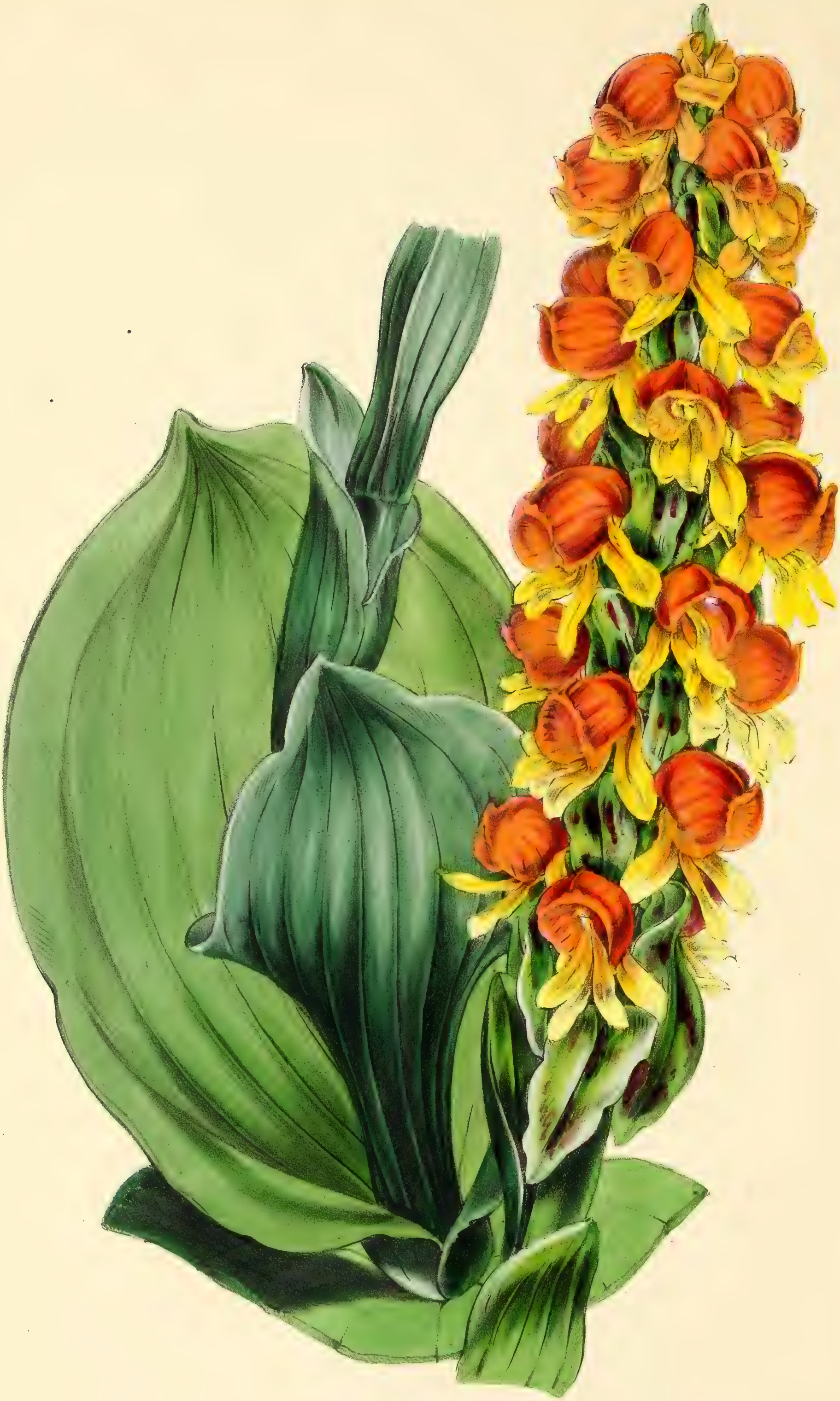
It was originally introduced by Messrs. Low and Son, in whose nursery, at Clapton, it flowered in September, 1842, when our drawing was made; it was, however, subsequently lost by them, and for its re-introduction we are indebted to Mr. James Drummond, who found it in an extensive forest on the borders of a large sandy desert in the Swan River Colony, and sent seeds of it to the Royal Gardens, at Kew, in 1842, where it flowered during the autumn of 1847.

Although the whole of the *Eucalypti* are considered greenhouse plants, yet many of them are nearly hardy, and the remainder should be placed in a very cool part of the greenhouse, and are all the better for being set in the open air during the summer months. They thrive in a mixture of equal parts of loam, peat, and sand, and may be easily propagated by cuttings of the half-ripened wood planted in sand under a hand-glass.

Of those which have succeeded in the open air in the warmer counties of England, *E. robusta*, *piperita*, and *rotunda* may be particularly mentioned: the two former flourish and grow vigorously in the Isle of Wight, where, in the neighbourhood of both Cowes and Newport, we saw plants in 1843, seedlings of but a few years old, which had already attained twenty feet or more high. They had stood two winters in the situations they then occupied, and had sustained no injury.

All the species abound in an aromatic essential oil. This becomes so concrete in *E. resinifera*, as to resemble gum kino. *E. robusta* also contains a large quantity of a similar red-coloured gum. *E. mannifera* exudes a saccharine mucous substance, resembling manna, both in its action and appearance. Other species are said to yield a similar secretion, and *E. Gunnii* is stated on being wounded "to furnish the inhabitants of Tasmania with a cool, refreshing, slightly aperient liquid, which ferments and acquires the properties of beer." The bark contains a large quantity of tannin, which is said to be stronger than that of the Oak.

The generic name is derived from *eu*, well, *kalypto*, to cover, as with a lid, because the limb of the calyx, which covers the flower before it expands, falls off in the form of a conical lid or cover. The specific name is given on account of the size of the fruit.



S. Holden, del. & Lith

Satyrium aureum.

SATÝRIUM AÙREUM.

(Golden-flowered Satyrium.)

Class.
GYNANDRIA.

Order.
MONOGYNIA.

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

Generic Character.—*Flowers* ringent; five anterior segments united at the base. *Labellum* behind, formicate, with two spurs or bags at the base. *Anther* resupinate. *Stigma* two-lipped.

Specific Character.—*Plant* perennial. *Lower leaves* broadly-ovate, obtuse, many-nerved; upwards they become more oblong, and the uppermost ones near to the bracts, tinged with red at the tips. *Flower-spike* six inches high. *Bracts* leafy, coloured. *Sepals* spreading, linear-lanceolate, acute, slightly keeled. *Petals* spreading, linear-lanceolate, acute: both these and the sepals are of a bright yellow. *Labellum* large, helmet-shaped, with a projecting point, and a curved denticulate border, keeled at the back, of a bright orange. *Spurs* short. *Column* incurved, somewhat cylindrical, bilabiate. *Pollen-masses* two-lobed.

Synonyme and Authority.—Satyrium, *Thunberg.*

This fine species of *Satyrium* is a native of the Cape of Good Hope, whence it was introduced a few years ago by Messrs. Young of Epsom, in whose nursery it first flowered in August, 1842, when our drawing was made.

Its fine rich orange flowers, and the ease with which the plant is grown, and the blooms produced, render it a very desirable species for cultivators of half-hardy and hardy Orchids.

It succeeds well in a pot of rough peat-soil, but the pot should be half filled with a mixture of broken crocks, charcoal, and sandy loam. Supply plenty of moisture when in a state of growth; but keep it perfectly dry during the season of repose. It requires only the shelter of a frame or a cold-pit, and thrives well if planted out in the frame in a mixture of sandy loam and peat. It will also grow when planted about six inches deep in a warm border, and protected by some slight covering in frosty weather, but exposed whenever the weather is fine and mild.

It is increased by dividing the tuberous roots. The name is derived from *Satyrus*, a Satyr, in allusion to its supposed properties.

Now that we are upon the subject of half-hardy Orchids, it might be as well to say a few words in favour of the cultivation of hardy ones, especially our British species, which, as many of them possess considerable charms, ought at least to have some share in our attention.

At Chatsworth we have for some years grown them in the rock-garden, for which they are particularly well adapted; in such a situation they flourish in a very superior manner, with but little care and trouble. The following are the kinds which have been chiefly cultivated by us:—

Aceras anthropophora—Green Man Orchis. This plant is always considered somewhat difficult to manage, and therefore it is generally kept in pots filled with a mixture of loam, peat, and sand, and abundance of crocks mixed throughout, and is placed in a shaded, cool frame, and during the period of torpidity is kept quite dry. In the rockery, it requires to be planted where the rays of the sun cannot reach it; and the soil in which it grows should be mixed with pieces of broken stone, crocks, or charcoal, to insure a free drainage. It is a very interesting plant.

Epipactis latifolia—Broad-leaved Helleborine. A plant usually grown in a pot filled with loam, peat, and sand, and a large proportion of broken crocks for drainage. In the rockery it should be planted where there is little soil, and where its roots can spread amongst the stones. It will not bear the direct light of the sun without injury, and requires therefore to be planted in a shady place.

E. palustris.—This is a superior species to the last. Plant it in a bed of peat in a shady part of the rock, and it will grow and increase freely.

Gymnadenia conopsea.—A fragrant purple flowering kind, found in damp meadows and grazing pastures, where it flowers in June. It is usually known by the name of *Orchis conopsea*, or Great Orchis. It may be planted in almost any part of the rockery, except where it would be exposed to great drought, which it cannot bear. The soil should be loam, peat, and sand well mixed with crocks, or broken stone, and charcoal. If cultivated in a pot, give abundance of drainage, and let the plant stand in a place partially shaded from the mid-day sun. It increases by separating the tuberous roots.

Habenaria bifolia—Small Butterfly Orchis; known also as *Platanthera bifolia;* is chiefly found growing on dry banks in woods. It bears greenish-white flowers, and grows about nine inches or a foot high, and may be found in bloom about the beginning of June. It is usually planted in pots of loam and peat, mixed with plenty of crocks. In its torpid state it should be kept quite dry, and is therefore placed in a frame or pit. In rockwork it should be planted in a dry situation under the shade of Ferns or other plants that will protect it from the sun. It is best to grow it in a very sandy soil composed of loam and sand.

Herminium Monorchis.—A small plant growing on chalky dry banks, with a very pleasant fragrance. The flowers are not conspicuous, being small and of a yellow-green colour. It may be found in flower about the end of June or beginning of July. This is a rather tender species, and should be potted in a mixture of loam, peat, and sand, with good drainage. If grown in a rockery, plant it in a partly-sheltered situation, and in winter protect it with an empty flower-pot. Increase is easily effected by separating the tubers, which are produced freely. It is by no means difficult to cultivate.

Listera cordata—Heart-leaved Tway-blade. Another very small Orchid, scarcely exceeding three incheshigh. It naturally grows on heaths in damp situations; the flowers are small, and of a brown colour; and the plant may be found in bloom in June. It is very easily cultivated in pots filled with sandy peat and broken crocks. In the rockery, it may be planted in any well-drained part, and requires no protection.

L. ovata—Ovate-leaved Tway-blade. This is of much stronger growth than the *L. cordata*, growing to the height of one foot or more. The flowers are green, and produced about the end of May. It may be found in woods; and should be cultivated in a situation where it is sheltered from the sun, and not exposed to drought. If kept in a pot, use sandy loam and one-fourth peat, with good drainage.

Ophrys apifera—Bee Orchis. Is rather a tender plant, and therefore is usually kept in a pot. The tubers are small, with but few fibres, and several may be planted together. The best soil is a mixture of peat, loam, and sand, with broken crocks. It should be sheltered in a frame or pit during the winter, and not be fully exposed until the frosts are over. It grows, however, very well in the rock; but must be planted in a particularly well-drained situation, and be covered with a flower-pot during the season of torpidity.

O aranifera—Spider Orchis. This requires very much the same treatment as the *O. apifera*. It produces its curious green flowers in April, and chiefly grows in chalky soils. Both this and the last are increased by separation of the roots.

Orchis fusca—Brown Orchis. A species met with in chalk districts, growing about a foot high, and producing its pretty brown and purple flowers in the end of May. If grown in a pot, use a mixture of light loam, peat and sand, in equal proportions. In the rockery, plant it in a well-drained situation, where it will not receive too much sunshine.

O. hircina—Goat Orchis. This plant does not produce its flowers until July; they are of a purplish-brown colour, and very pretty. It thrives pretty well in loam, peat, and sand, and should have a well-drained situation in the rockery. If grown in a pot, it must be preserved from winter rains and frost in a frame or pit; but if planted out, place a flower-pot over it during the season of torpidity.

O. latifolia—Marsh Palmate Orchis. A very common but handsome species. It may be obtained in marshes and moist meadows almost in all parts of the country. This is of the easiest culture, growing either in pots, a shady damp border, or in a moist part of the rock-work. The proper soil for it is a mixture of equal parts of peat and loam.

O. maculata.—Another common but handsome species; it is of the easiest management, either as a common border plant, or in a pot. The best soil for it is peat and loam; and it should always stand in a shady place.

To cultivate the above species successfully, the following particulars should be borne in mind:—That the best soil is a mixture of loam, peat, and sand; or, in the absence of peat, a loam as sandy as it can be obtained; with a large proportion of drainage:—That lime and chalk are not necessary to be added to the soil, even for species which naturally grow in districts where the soil contains these ingredients in a large proportion.

Drainage should consist of broken crocks, broken freestone, and charcoal; the first and the last are especially used when the plants are kept in pots; and the broken stones when they are planted in the rock-garden or on borders.

The best time to take them up from their native localities, is in spring, just when the plants are beginning to grow; and the very worst time is when they are in full bloom. Always remove then with as large a ball of earth and as many fibres as possible.

Previously to replanting, it is advisable to divest them of all the soil in which they naturally grow; for we have invariably found that if, planted with the old ball of earth, they either grow very weakly, or perish altogether after they have done flowering.

They never thrive well if the soil in which they are planted becomes covered with moss; it is therefore advisable to keep the mould often stirred, and especially if grown in pots this precaution is necessary, as is also an occasional top-dressing of new soil, to answer the same purpose. All require more or less shade; they will flourish if exposed to morning and evening sunshine; but seldom live long if the full power of the mid-day sun shines upon them.

Those which are mentioned above as requiring shade, are such as will thrive best on a north aspect, where the sun's rays can seldom reach them.

If any are kept in a cold frame, it is always best to place it facing the north; otherwise it would be necessary to cover with a mat, which produces a darkness too heavy and unnatural. In watering during the season of growth, always administer with care: although the supply should be liberal, yet it is better not to give too much at a time. In the rock-garden, or on the borders, it is not often necessary to resort to watering at all; but if the plants are in pots, or are not planted in proper situations, watering must be attended to.

In the season of torpidity, let them always be kept as free from moisture as they well can; over the more tender-rooted ones it is advisable to place an empty flower-pot: it will prevent an accumulation of wet from damaging the crowns.

ON CUTTINGS.

To resume the subject of Radification, which was quitted somewhat abruptly in the last number, we must, in the first place, admit that professional gardeners contemn the practice of striking cuttings of plants in water, or at least they regard the attempt as a plaything, little worthy of those to whom the superintendence of large establishments is confided.

There is no one thing in nature that ought to be despised, yet it may safely be admitted that all things, however good in themselves, may not, to all men, be expedient. It becomes the peculiar province of the amateur, whose delight it is to observe the phenomena of vitalised organisation, to seize and report every interesting fact, and *as such* we venture unhesitatingly to assert, that there is no operation of horticulture which does more to elucidate the process of radification than does that of placing cuttings of every kind of plant, shrubby or herbaceous, in phials of simple clear water. Some years since, experiments of this description were made to a considerable extent, and these were publicly stated.

Not, however, to dwell upon minutiæ, we need only refer to a great number of shrubs; one of which is the lovely old-fashioned *Hibiscus Rosa sinensis*, double and single, which will slowly and progressively develope in water, first the ring of granular matter between the wood and bark of last year, and then fibres. The *Hoya carnosa*—even the single leaf, though it does not appear that from *it* any bud or germ of a shoot can proceed; the *Scarlet Pelargonium* at any season; the *Nerium Oleander splendens*, which will not only strike but grow, and prosper for two years by a renewal of the same fluid. The shoots, leaves with a bud, or single leaves of all the *Gloxinias* will protrude granular matter, and form a bulb, if so it may be called. Mint, Peppermint, Myosotis, and numbers of vegetables will yield long roots with great velocity, and plants, of the Melon family, will do the same. One Cucumber leaf without a bud we have observed to fill a large bottle. Let any one try such plants, and hundreds of others, in every imaginable way, either as to the form, the size, the age, or the situation of the cutting as to light, shade, temperature, plunged or unplunged; and if he do not observe ample cause for high admiration, and effects more wonderful than has been appreciated by merely practical operators, we shall be much surprised indeed. Cuttings placed in a clean glass phial of water exhibit the processes of nature without obstacle, and may be lifted from time to time sufficiently to permit of even microscopic investigation without injury: this is a great advantage to the physiologist.

These cuttings doubtless obey the natural law to a great extent; but not entirely so, because the element or fluid medium is different, and much light permeates the transparent vessel; however, as the internal organisation of the vitalised member remains the same, it will be just to offer to the reader those judicious observations that are found in Loudon's Encyclopædia, "Science of Gardening," 2877, *et seq.*

"The proper time for taking cuttings from the mother plant, is when the sap is in full motion, in order that, in returning by the bark, it may form a *callus*, or protruding ring of granular substance between the bark and the wood, whence the roots proceed. As this *callus* or ring of spongy matter is generally best formed in ripened wood, the cutting, when taken from the mother-plant, should contain a part of the former year, or in plants which grow twice a year, of the wood of the former growth; or in the case of plants which are continually growing, as most evergreen exotics, such wood as has begun to ripen or assume a brownish colour. This is the true principle of the choice of cuttings as to time." "Cuttings from herbaceous plants are chiefly chosen from the raw growths which do not indicate a tendency to blossom; but they will also succeed in many cases when taken from the flower-stems, and some rare sorts of florists' flowers and border flowers, as the Dahlia, Rocket, Cardinal Flower, Scarlet Lychnis, Wall-flower, &c., are so propagated. The preparation of the cutting depends upon the principle that the power of protruding roots resides at what are called the joints, or those where leaves or buds already exist. Hence it is that cuttings ought always to be cut across, with the smoothest and soundest section possible, at an eye or joint."

"*Cuttings which are difficult* to strike, may be rendered more tractable by ringing; if a ring be made on the shoot which is to furnish the cutting, a *callus* will be created, which if inserted after the cutting is taken off, into the ground, will readily emit roots." The amputation must be made below the circle, and the cutting must be so planted as to have the callus covered with earth.

The position of a cutting when inserted *in soil*, is of no little moment in cases of difficulty. "Thus Mr. Knight (of Downton) found the Mulberry strike very well when the cuttings were so inserted as that their lower ends touched a stratum of gravel or broken pots." And a Mr. Hawkins (as *per* "Hort. Trans.," vol. ii. p. 12) who had often tried to strike Orange-trees without success, at last heard of a method, (re-discovered by Luscombe) by which, at the first trial, eleven cuttings out of thirteen grew. "The art is, to place them to touch the bottom of the pot; they are then to be plunged in a bark *or hot-bed* and kept moist."

We have, by these abbreviated extracts from Loudon, endeavoured to interpret the practical theory of propagation by cuttings when inserted in sand, heath-soil or bog-earth, garden-mould, and the like. Whether or not the *position* of the cutting placed in a phial of soft water, may be influential, has not been made the subject of inquiry. It might so happen that were the base made to repose upon a layer of little fragments of pots, an interflow, upon the principle of Dutrochet's *endosmosis* and *exosmosis* might be established, and thus keep the vital fluids in a more active condition; at all events, they who possess the means would do well to have recourse to them. Amateurs of intelligence may rest assured that *they* are the parties who will discover, and should make known their discoveries to the horticultural world.

It is generally supposed that the granular substance, which ultimately protrudes fibrous roots, is a generation of new organised matter; but herein parties are at issue. It is quite certain that the smallest particle of Fern-seed, perfectly invisible to sight, contains a plant true to its genus and species. The same may be said of the proud and gnarled Oak. Are we to suppose that either the one or the other, during the progress of growth, or when arrived at maturity, has received one particle of newly-formed (created) matter? Yet, what a vast amount of substance has been acquired! and what, indeed, *is* growth? Man cannot fathom these mysteries; yet the inquiry is neither profanely daring nor useless in itself, since, in the reflecting mind, it must lead to admiration. But taken philosophically, it were well to recur once more to the theory of a wise man, lately deceased at an advanced age, who had been a zealous servant of Horticulture during a long course of years. We allude to the late Mr. James Main, who published a treatise on Vegetable Physiology, in which he assumed as his great and leading position, that *every being is originally perfect in all its parts*, and consequently that every *increase* in bulk, or *apparent* addition of parts or of members, are just so many phenomena of *development*, and nothing more.

Thus, "vegetables have an organic frame containing certain specific qualities; the *former* is *rudimental*, mutable in texture, and expansible under the action of air, heat, light, and water; the latter are *accretive*, in consequence of accessions of vegetable food received from the earth and atmosphere. As the frame is extended or expanded, additional food is required to fill up and distend the swelling vessels, whereby the whole is enlarged in bulk and weight; this process being continued till the plant arrives at maturity if an annual, or for ever if a perennial." "Now I hold it questionable," continues Mr. Main, "whether any of the food goes to *generate organisation.* That it fills, distends, supports, and is in fact in connexion with the inherent qualities of the plant, the cause of its growth and amplification, is perfectly obvious; but that fluids, whether aqueous or gaseous, however gross, can be *changed* into *organic* structure; or even into a single cell of that structure, is beyond the powers of my comprehension."

Mr. Main had not then obtained any knowledge of those remarkable discoveries of *organic chemistry* which have recently led to the now generally-received theory, that nutriment and growth are processes of *assimilation*, by which the elements or constituents of cellular membrane, of water, gum, sugar, gluten, albumen, &c., &c., found in vegetable and animal organic bodies, are derived from corresponding elements already existing in the food, but diverted and appropriated by vital energy to the specific wants of each and every individual. His mind had obtained a glimpse of certain great truths. These truths he then announced; and the philosophic chemist has subsequently been enabled to embody them in a rational hypothesis. Thus nothing can be *generated;* and so far Mr. Main must stand justified with many who doubted. Assuming the *callus*, or first apparent granules of root, whatever form they take, to be nothing more than changed, enlarged *cambium* (*Succus proprius*), we solicit the utmost attention of the physiologist to the earliest phenomena of radification as they become revealed from cuttings placed in water.

Mr. Main thus proceeds to describe his theory of a *vital membrane,* called by him Indusium. "There is a distinct member situated *between the liber and alburnum.* So that if waxed paper be placed within this membrane, the new alburnum will be formed on the outside; but if placed on the exterior side, the new deposit will be invariably found within it, and just where it would have been had no paper been inserted.

"*Cambium,*" according to Dr. Lindley, "is a viscid secretion, which in the spring separates the alburnum of an exogenous plant from the liber. It is free vegetable mucilage, *out of which* the new elementary organs are *constructed,* whether in the form of vessels or woody tissue, or of cellular tissue of the medullary system, whose office is to extend the medullary plates, and maintain the communication between the bark and central part of the stem."

Here then we must recur to the grand question, is the *Cambium* a vitalised membrane, identical with the Indusium or not? Cambium is present when the bark detaches; it is the organised matter that causes the junction of a graft with its stock, and which, at least, contains the germs of buds, leaves, and all progressive developments!

ON THE CULTURE OF THE MOMBIN, HOBO, ZANZEE, AND OTHER SPECIES OF HOG PLUMS,

AS TABLE FRUIT.

In this improving and scientific age it might be well to call particular attention to Tropical Fruit Trees, a class of plants, which although for the most part ornamental, and many long inhabitants of our stoves and greenhouses, have certainly not hitherto received that attention to their culture, which the merits of many of them deserve. It is true Guavas, Mangos, Rose-Apples, Granadillas, Loquats, and some others, have yielded their fruit in several parts of this country, but their cultivation for this purpose has been too limited, and is too little understood by the generality of gardeners to be considered an important item in garden operations.

The low price of glass, however, in the present day, and the gigantic structures which have been built, and are at present in course of erection, in different parts of the country, will probably lead to results of the most important kind. A few years ago who would have ventured to assert that the various species of Banana would have formed any part of the dessert of our tables? Yet such is the case, and that by very simple cultivation. And who would venture to deny that in a few more years our tables will not daily exhibit splendid specimens of Mangos, Mangosteens, Sapota Plums, Lee Chees, Blimbings, Custard Apples, and many others, which, except as they are eaten in their native countries, or are brought here in a partly dried state, are all but unknown, except by name, to the greater part of the gardeners of this country?

Already some of these novelties have begun to exhibit themselves in the large

Conservatory at Chatsworth, and every succeeding year, if attention be paid to their culture, in various parts of the country, new facts will be elicited, and fresh interest awakened, until at no distant period it will become as common to see a Lee Chee, a Mango, or a Mammee tree loaded with fruit, as it is now to see one loaded with Oranges.

In commencing to treat on these plants, and bringing them one by one under notice, perhaps the various species of Hog Plums, (*Spondias* and *Poupartia*) might very properly form the first article, especially as the *Mombin*, or yellow-fruited species, (*Spondias lutea*), produced its pleasant eating plums in the Conservatory at Chatsworth during the last autumn ; and if we might venture an opinion from their flavour, we should say, that under judicious culture, they may some day become classed with the first-rate fruits of our tables.

By way of commencement it might be as well to say, that the two genera bearing what are popularly called Hog Plums, are placed by Dr. Lindley, in his "Vegetable Kingdom," under the Natural Order *Anacardiaceæ*, or Terebinths, along with the Mango, (*Mangifera indica*), and other resiniferous plants ; although they previously stood alone, and formed an order called *Spondiaceæ*. The Doctor, however, considers their characters not sufficiently distinct to justify their being placed apart from Terebinths, and gives the following as his reasons, which certainly carry with them considerable weight. "There is in tropical countries a genus called *Spondias,* whose fruit is eaten under the name of Hog Plums, which genus it has been proposed to erect into an Order, called *Spondiaceæ*. It differs from *Anacards,* in having a many-celled instead of a one-celled one-seeded drupe ; and on this more than anything else the character of the supposed Order was made to depend. But it appears that in the beginning *Spondias* have five distinct carpels, inclosed within a large fleshy cup, and that the growing together of these carpels is an after operation, unconnected with original structure ; a Mango, in fact, if it had five carpels instead of one, would be almost a *Spondias*. For this reason the supposed Order does not seem to be tenable. It is true that its ovules are described as being suspended from the apex of the cells ; but this seems to arise from the cord contracting an adhesion with the side of the cells."

All the species form trees of considerable size, having unequally pinnated, alternate, dotless leaves, with occasionally a few simple ones intermixed. The flowers are produced in both racemes and panicles, and are both axillary and terminal. They are for the most part small, and not very conspicuous. The fruit of some of the species is nearly round, (amongst which is included the *lutea*), and that of others, exactly in the form of a golden-drop plum, and much about the same size. The plants possess no resinous juice, like the *Mango* and other allies of the same order. In the centre of each fruit is a fibrous five-celled nut, which, when full grown, occupies nearly one-half of the drupe. The flesh surrounding the nut is much eaten both in the Brazils and West Indies, and one species in the Society Islands, not yet introduced to this country, has so rich a flavour that it is likened to that of the Pine-Apple.

S. LUTEA, (*fig. a*)—This species is a native of various parts of South America and the West Indies; it forms an upright growing tree (as figured in the wood-cut), and in its native localities attains the height of fifty or sixty feet. The natives call it *Mombin*, *Hobo*, and several other names, most likely from there being different varieties, slightly varying from each other; indeed, one kind in Jamaica is said to form a very superior fruit, and is cultivated for this purpose in various parts of the island. Large branches broken from the trees easily grow; they are therefore planted to form hedges, which, in the course of a few months after they are separated from the parent tree, and stuck in, will bear a considerable quantity of good, fine-swelled, fruit. This, however, must be partly attributed to the genial climate in which they are naturally found. They are also planted in pastures, two or three together, to form a shade under which sheep may retreat from the burning rays of the sun. The flowers are yellow, small, and produced in large quantities upon terminal semi-globose panicles, six to eight inches long. The fruit is yellow, tinged on the sunny side with deep orange, and an occasional purple spot, and is about the size of a white Bullace-plum and of the same form. The flesh is melting, with an agreeable acid, and certainly possesses a delicious flavour. The rind is thin, and when the fruit is ripe separates readily from the flesh, leaving the latter quite entire; it has then the appearance of a lump of clear jelly, slightly tinged with golden yellow, and exhibiting distinctly the fibrous stone in the centre. When the fruit is full-grown the stone occupies nearly one-half of it, and the flesh is somewhat adherent.

The plant which flowered and fruited at Chatsworth last year, and from which our woodcut and description was made, is planted in the border in a cool part of the large conservatory, not far from the situation occupied by tender greenhouse plants. It is evidently of slow growth, having only attained the height of sixteen or seventeen feet during as many years; it, however, seldom receives any direct sunshine, as the large plants of *Musa sapientum* and *paradisiaca* stand betwixt it and the sun, and cast their shadows far beyond it; whether this is a disadvantage or not, we can scarcely say; there is, however, no doubt but it would endure more light, and that less heat than it now receives would be sufficient for both the development of its foliage and flowers, and the perfecting of its fruit. We are led to this conclusion because the plant always shows signs of suffering when subjected to strong heat, and is soon covered with insects and filth.

Our plant began to exhibit its panicles in April, soon after the house had been subjected to a growing temperature. The flowers expanded in May, and the fruit was well ripened and fit for table by the middle of the following September. The blossoms are borne on the wood of the previous year's growth.

The following few directions will perhaps be a sufficient guide to its successful cultivation:—

Subject the plant to a very moderate stove heat, and if convenient plant it out into a prepared border.

If planted out, the best soil is a light turfy loam; but if grown in a pot or tub, make a mixture of two parts sandy loam, and one part very rotten dung, with a small portion of vegetable mould.

Always give a good drainage by laying plenty of broken crocks, freestone, or charcoal at the bottom of the pot or tub.

During the whole of the summer season water liberally at the roots; and when the plant is growing freely, syringe every fine day; but in winter give no more water than is absolutely necessary to keep the plant from flagging.

Pruning is not requisite, excepting to remove branches which interfere with other plants, or to improve the shape.

Cuttings are easily struck in pots of sandy soil, or sand, placed in a moderate heat, and covered with a hand-glass.

Spondias purpurea.—Purple Hog Plum. This is also a native of the West Indies and different parts of South America. It is the *S. Mombin* of Linnæus, and the *S. Myrobalanus* of Jacquin and Gœrtner. The flowers are small, red, and are produced in simple racemes. The fruit is ovate, of a dull purple colour, somewhat streaked with yellow, and usually measures about an inch in length. The flesh is transparent and yellow, with a flavour resembling the last. The tree grows from forty to fifty feet high, and may be cultivated in the same manner as *S. lutea.* In its native country it is very often used as a hedge plant, and "boughs are set in the ground when in flower, and in two or three months are laden with ripe fruit." It is often called the Spanish Plum-tree.

Spondias Zanzee.—Zanzee Plum. This plant is a native of Guinea, where it forms a large spreading bush of sixteen to twenty feet high. The flowers are borne in terminal panicles, and the fruit is the size, form, and colour of our Common Sloe, the produce of the wild blackthorn (*Prunus spinosa*). The flavour greatly resembles that of the *S. lutea*, and no doubt the same treatment will be suitable.

Spondias Oghigee.—Oghigee Plum. This is also a native of Guinea, where it grows into a spreading tree, sixty feet or more high. The flowers are white, diminutive in size, and are produced in large, spreading, terminal panicles. The fruit is oblong, and grows to the size of a pigeon's egg. It is doubtful whether either this species or the last are yet introduced to England; if not, they certainly deserve to be so.

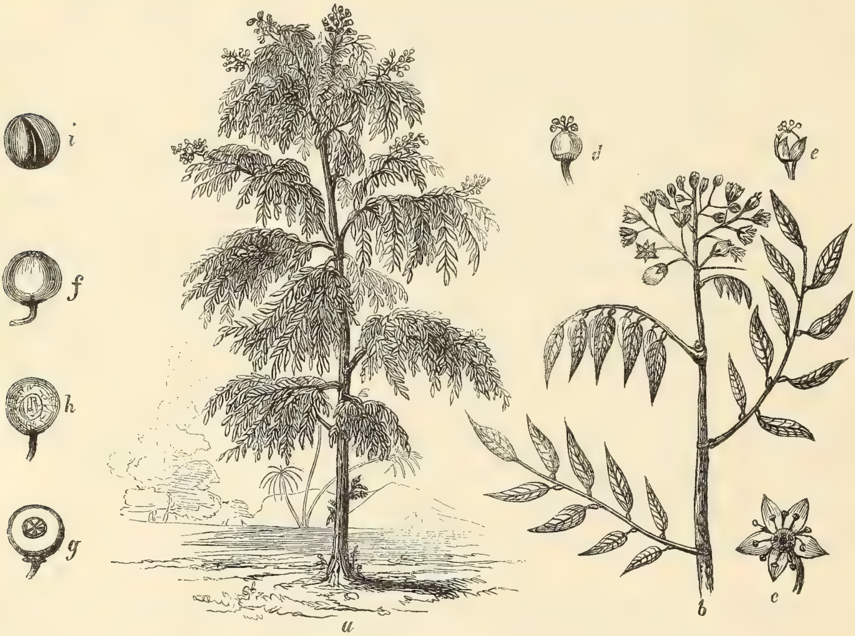
POUPARTIA.

The Genus *Poupartia*, which was formerly associated with *Spondias*, consists of three known species, all bearing eatable fruit, of some value in their native countries, but which to us are too little known to admit of an opinion upon their merits.

P. Borbonica.—The Bourbon Plum or Bois de Poupart, is a native of the Island of Bourbon, where it attains the height of forty or fifty feet. Its pinnated leaves are very long, and contain from eleven to nineteen leaflets. The flowers are dark purple, small, and produced in terminal racemes. The fruit is small, dull yellow, and of a pleasant flavour. It was introduced in 1825; but its flowers being inconspicuous, little attention has been paid to its culture, and it is now rarely seen in our stoves.

P. DULCIS.—This old inhabitant of our hothouses is a native of Java, Moluccas, and the Society Islands. It has borne many names, amongst which may be mentioned the Otaheite Apple, *Spondias dulcis*, *Spondias cytheræa*, and the Sweet Java plum. The flowers are produced in terminal panicles, and "the fruit is large, smooth, of a golden yellow colour, and a somewhat nauseous fœtid smell, containing a sweet, aromatic, succulent pulp." The tree is cultivated to a great extent in the Society and Friendly Islands, especially in Otaheite, for the sake of its fruit, which is esteemed one of the most wholesome; it has almost the flavour of a pine-apple. Its cultivation is the same as that of *Spondias lutea.*

P. MANGIFERA.—Daho, Mango-plum, Bitter Hog-plum, Mangifera pinnata of *Linnæus,* Spondias mangifera of *Persoon,* Spondias amara of *Lamarck,* and Catambalan of *Rheed.* This fine tree is a native of Java, and other parts of the East Indies. The fruit is oval, of a yellowish green colour, an inch-and-a-half long, eatable, and agreeably fragrant. It was introduced in 1820, and might be readily obtained by persons desirous of cultivating it for the sake of its fruit.



DESCRIPTION OF THE WOOD-CUT.

a The appearance of the *Spondias lutea* when in fruit at Chatsworth, in Aug., 1847.
b A detached branch, to show the pinnate leaves and panicle of inflorescence.
c A detached flower, exhibiting the five petals and ten stamens seated round the disk.
d The ovary crowned with its five stigmas, having the calyx detached, to show the annular disk.
e The ovary, with the calyx attached.
f The appearance of the fruit when ripe: one-third of the natural size.
g The fruit cut open to show the seeds within the fibrous stone.
h The fruit, with the outer rind separated, showing its transparent pulpy flesh, and the stone imbedded in the centre.
i The detached rind of the fruit.

THE LIGN ALOES, LIGNUM ALOES, ALOE WOOD, OR AGALLOCHUM OF THE ANCIENTS.

Aloe-wood, or Lign Aloes, is mentioned by Herodotus and several other ancient writers, as a substance of the greatest value; it emits a fragrance, which in the East is more highly esteemed than that of any other known plant; it was, therefore, at a very early age made use of to perfume the clothing and apartments of all persons of distinction, especially as the scent is by no means evanescent, but will endure undiminished for years. The wood also admits of a high polish, and in that state exhibits the most beautiful graining; this, in connection with its rich perfume, rendered it a suitable substance in which to set the most precious gems; for this purpose it was carved into all manner of fantastic forms, to suit the fancies of the purchasers, and was worn in the head-dresses, or other parts of the persons of both sexes, when in full costume.

It was also nearly as much esteemed for medicinal purposes, as for its fragrance, being considered stimulant, cordial, cephalic, corroborant, and a certain remedy against vertigo and paralysis; in fact it only yielded in value to the famous balsam of Gilead (*Balsamodendron Gileadensis*). Although these properties were no doubt greatly exaggerated, and some of them were altogether fanciful; yet it no doubt possesses some medicinal qualities, and at one time found its way into the "Materia Medica" of our own country; and was said to be successfully prescribed by some continental physicians, in cases of gout and rheumatism. It has, however, long since fallen into disuse, perhaps from being superseded by other medicines of more active and potent properties.

It was also one of the substances which, in Eastern nations, was burnt as incense on high festivals to propitiate the Gods; and even in the present day, it is much used in connection with other fragrant substances, by the Moors and Chinese, for the same purpose.

On these several accounts it sold at a very high price. Some of the ancient writers tell us, that it could only be purchased in their day, for its weight in gold. And Herodotus mentions, that it was once deemed of more value than gold. Of course many fables were in circulation as to the origin of so estimable a commodity, all tending to point out the extraordinary difficulty with which the article was obtained.

Respecting the tree which produces this fragrant substance, there has always been a difficulty in defining, arising from the imperfect knowledge the ancients possessed of Botany, and the very meagre descriptions, which were furnished by them to succeeding generations. In the present day two plants, both natives of the East Indies, one growing in the hot plains, and requiring stove heat, the other growing on the highest mountains, and only needing the temperature of the greenhouse, claim this distinction. It is not easy to tell which of these has the priority; perhaps both were formerly known, and the produce from each was sold indiscriminately as Aloe-wood or Lign Aloes, without any notice being taken of the very different habits of the plants which produced it. We are rather disposed to this belief, because, although the greater part of the Aloe-wood used in Palestine, and other neighbouring nations, might have been brought from the East Indies by merchants,—yet a passage in the Bible favours the supposition, that some trees producing this article must have grown naturally in Arabia, and were well known to the persons to whom the words alluded to were spoken. The passage referred to is in Numbers, chap. xiv., and verse 6: "As the valleys are they spread forth, as gardens by the river's side, as the trees of *Lign Aloes* which the Lord hath planted, and as cedar trees beside the waters." Now, unless the trees mentioned here were known to the parties to whom this speech was addressed, the force of the illustration would not be apparent to them; and it is scarcely probable that a person placed in the peculiar position of this speaker, would have selected a plant with which his auditors were wholly unacquainted. And as, too, the Aloe Tree is mentioned in connection with the Cedar, and stated to be of the Lord's planting, in distinction from the planting of man; it would convey the idea of a natural grove or wood of these plants, just as the cedar formed a natural forest on the banks of Mount Lebanon by the side of the river.

Having premised thus far, it remains to point out the two plants which produce this valuable article of commerce, and to mention which was the probable one that appears to have occupied natural situations in Syria, and the neighbouring countries.

The first is called *Aquilaria Agallochum*, Eagle-wood, Agila-wood, or Aloe-wood. This is a native of the East Indies, where in the hot plains it forms a large spreading tree; and is called by the natives *Ugoor* or *Ugooroo*, but by Europeans Lignum Aloes, or Lign Aloes. This plant is peculiar in its construction and habit, and has, therefore, with a few others, which agree with it in several important particulars, been formed by botanists into a Natural Order called *Aquilariaceæ*. The second is named ALOEXYLON AGALLOCHUM, and grows wild on the highest mountains of Cochin China, and the Moluccas, where it forms a lofty upright growing tree, of no mean appearance. It is a very different plant from the last, and is associated with the Natural Order *Leguminaceæ*.

The first of these plants, from its native localities in the hot damp Indian plains, would ever require the constant heat of the stove; whilst the other, growing naturally on high mountains, although at times subjected to considerable heat, would yet, in some parts of the year, be exposed to many vicissitudes of weather, and considerable cold. Now it is well known, that in Palestine, although the heat in summer is great, yet during part of the year the weather is cold, and even frosty; it is therefore scarcely probable that the *Aquilaria Agallochum* would grow and flourish in a climate, so very dissimilar to the one in which it is naturally found; whilst the *Aloexylon Agallochum*, being a greenhouse plant, if not really a native of Arabia, might have been introduced at a very early date by some enterprising traveller, and from the advantages of its new climate, might have become naturalised, and shedding its seeds, have formed natural woods in the various countries to which it had been brought. Although this supposition does not admit of proof, still it seems no more improbable than that of various species of Exotic Oaks, and other trees found in this country in the present day, having now become so naturalised, that but for the records of their introduction, we might be led to claim them as the indigenous productions of our soil.

The Aquilaria Agallochum forms a broad spreading tree. *Leaves* alternate, simple; obcordate, entire, without dots or stipules. *Flowers* yellowish green, united, produced on axillary racemes. *Calyx* tubular, somewhat top-shaped, coriaceous, with a five-cleft limb; segments spreading, ovate, acuminate, with an imbricated æstivation; orifice furnished with scales. *Stamens* ten, all fertile, short; scarcely exserted; anthers long, two-celled. *Ovary* superior, sessile, downy, compressed, two-celled. *Style* very short. *Stigma* conical, large, simple. *Capsule* pyriform, two-valved, two-celled. *Seeds* solitary in each cell.

Although this is one of the trees which affords the fragrant substance so much esteemed; yet its wood is stated by travellers who have examined it, to be, in its natural healthy state, white, and almost scentless. The importations of a rich dark brown colour, which possess so fine and peculiar an aroma, are said to be the produce of trees, which are old and diseased; "the oleaginous particles stagnate, and concrete into resin in the inner part of the trunk and branches, by which the natural appearance of the wood is altered, so as to be of a dark colour and of a fragrant smell At length the tree dies, and when split, the resinous part is taken out. It seems to contain little else than that camphoraceous matter common to many other plants. From its bitter taste it has the name of aloes." * It was also called by the ancients Calambac.

None of the species of *Aquilaria* can boast of much beauty as flowering plants, although as trees they are far from being devoid of interest; except however in Botanical Gardens, or where private collections of curious plants are desirable, they can scarcely be recommended for general cultivation. They require the temperature of the stove, and the same treatment as other common stove plants; and will no doubt strike freely from cuttings planted in pots of sand, and placed under a handglass in heat.

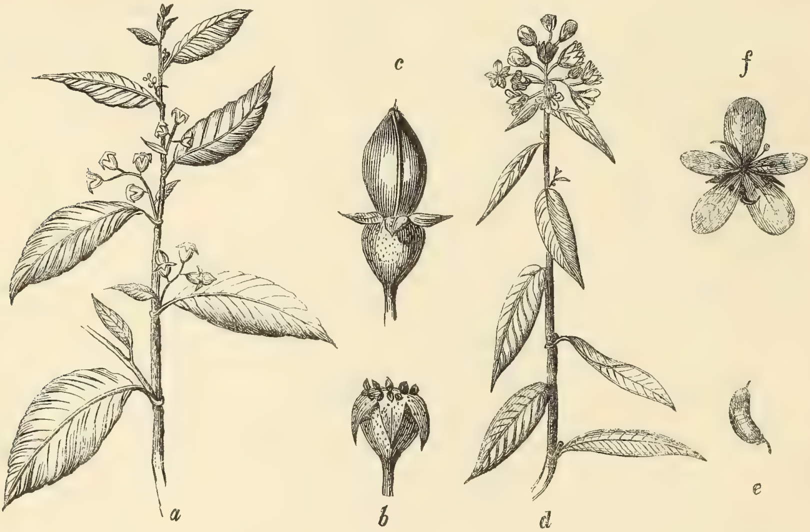
The Aloexylon Agallochum forms a large, upright growing tree. *Leaves* simple, alternate, lanceolate, acuminate, entire, with short petioles. *Flowers* produced in terminal panicles. *Calyx* of four sepals, acute, deciduous, three upper ones nearly equal, lower one nearly twice the length of the others, falcate, incurved. *Petals* five, unequal, upper large, two lateral ones narrow, two lower ones somewhat broader. *Stamens* ten, distinct, spreading. *Ovary* compressed. *Style* filiform. *Legume* woody, falcate, one-seeded. *Seed* oblong, curved, arillate.

This species, like the *Aquilaria* or Eagle-wood, is said to owe its exquisite fragrance to some morbid action, which changes the secretions into the highly aromatic oils and resins upon which the value of the wood depends. This plant is more ornamental than the last; the flowers, although small, being from their colour more conspicuous.

---

* Don's Syst.

It only requires the temperature of the greenhouse, and to be potted or planted in a light soil, composed of peat, loam, and sand; and cuttings of the half-ripened wood planted in pots of sand, and placed under a hand-glass in a moist heat, will strike readily.



DESCRIPTION OF THE WOODCUT.

a A branch of Aquilaria Agallochum, showing the inflorescence.
b A detached flower of the same.
c The capsule of the same.
d A branch of Aloexylon Agallochum.
e A seed-pod of Aloexylon.
f A detached flower.

FLORICULTURAL NOTICES.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Acacia dodonœifolia. In the gardens of the Horticultural Society, Chiswick, we noticed this species of Acacia in great beauty. The specimen is near six feet high and five feet in diameter, completely covered with its rich golden globe-like flowers. This species possesses the merit of flowering when very small, which considerably enhances its value, especially when blooming at this season, and to those with whom space is an object.

Brassavola glauca. This fine species has been flowering remarkably well in the Orchid stove of S. Rucker, Esq., Wandsworth, Surrey. The specimen exhibited upwards of five of its broad white flowers, fully expanded, showing a degree of beauty rarely obtained from this species. It was introduced by Mr. Hartweg, the collector for the Horticultural Society, from Vera Cruz.

Cœlogyne flaccida. In noticing this plant, we may refer to the possibility by good cultivation of making that, which, with a single flower or a spike of flowers, has no particular attraction, become an object of the greatest admiration; and when seen in the beauty we saw it in the collection of S. Rucker, Esq., under the very careful management of Mr. Mylam, calls forth our utmost praise. The specimen had upwards of thirty spikes of bloom, all fully expanded, hanging gracefully down the side of the pot. The species is well known for its pendulous racemes of semi-transparent, white, waxy flowers, and possesses a very pleasant odour which adds to its attractions.

Croci. We found flowering several fine species of Croci in the gardens of the Horticultural Society, Chiswick, which formed part of the collection of the late Dean of Manchester. They are much larger, richer in colour, &c., than the ordinary varieties in cultivation. One was particularly beautiful, being white, and most delicately pencilled and feathered with lilac equal to any tulip, and enriched with brilliant golden anthers; another was rich blue lilac, and tipped at the points of the petals with a much deeper colour; a third was an intensely bright purple; a fourth was bright orange, expanding star-like, having at the base and on a third of the petal a paler colour. They will prove great attractions in collections of this most serviceable race of bulbs.

Dielytra spectabilis. In the nursery of Messrs. Knight and Perry, this scarce and very beautiful species is now blooming, though, from the season and being in the stove, it is not seen in such beauty as it ought; still, sufficient is visible to prove its value. It is expected to be as hardy as the other *Dielytras*, from its being found in the same locality as the *Weigela rosea*, viz., in the island of Chusan. A well-grown specimen produces racemes four or five inches long, holding a profusion of delicate rosy-pink flowers somewhat heart-shaped. Mr. Fortune states that it is one of the favourite plants of the Mandarins, who give it the name of the Red and White Moutan Flower, most probably from the great resemblance in foliage and habit to the Moutan Pæony. Mr. F. also says it lasts a considerable time in flower, and we find (from the specimen here noticed) that it will be a most useful plant for early forcing, as it requires only a very moderate amount of heat to excite it to bloom, the present subject being in heat about three weeks and is most beautiful. We believe this to be the second time of its flowering in this country, a specimen having bloomed last summer (1847) in the gardens of the Horticultural Society, Chiswick, and noticed as one of the many interesting plants introduced there by Mr. Fortune.

Lycaste Skinnerii. Mr. Rucker has had several fine varieties of this most beautiful species in flower, all apparently growing from the same bulbs, yet varying so much in size, shape, and colour, as to make them varieties of each other, which in the specimen gave increased attraction. One variety was large, white, and had a richly-spotted labellum; a second smaller, and a rich rose-colour, with a lip pale and slightly spotted; the rest varied betwixt the two above-named. The finest variety we noticed in flower in the nursery of Messrs. Rollissons, Tooting, having upwards of twenty expanded flowers and buds on one specimen, the whole being of a deep rose-colour, with the lip richly spotted with crimson. Messrs. R. had another variety, very attractive, the petals shorter, broader, and slightly tinged with rose-colour; labellum pale, but well-covered with crimson spots.

Sericographis Ghiesbregtiana. This species we found flowering in the nursery of Messrs. Rollisson's, Tooting. It has a very graceful appearance, and, flowering during the winter months, is highly serviceable. The flower-stems, branched, are produced at the axils of the leaves and the ends of the shoot, holding upwards of ten bright-red flowers on each stem. The foliage is neat, and a bright green. The plant is generally known as *Aphelandra Ghiesbregtiana*.

Tillandsia Stricta. A most charming little species, growing suspended from the rafter in the stove of Messrs. Henderson, Pine-apple Place Nursery, Edgware Road. The specimen was very small, had a ball-like appearance, with its richly-coloured flowers bristling from every side. The plant is but an inch-and-a-half long before the flower-scape appears, and this does not extend three inches farther, and is of the richest crimson, both stem and bracts; and the tiny flowers are deep purple.

Vanda insignis. Messrs. Veitch and Sons, Exeter, forwarded recently a fine specimen, in flower, of the above for exhibition, to the Horticultural Rooms, Regent Street. It belongs to the *Roxburghii* and *tessellata* varieties, though much finer and more handsome; has a large broad labellum, of a rich lilac, the sepals and petals striped and spotted with brown, on a ground almost white. In habit it differs little from the family to which it belongs. The species is deservedly a great favourite with all cultivators of this handsome race of Epiphytes.

OPERATIONS FOR MARCH.

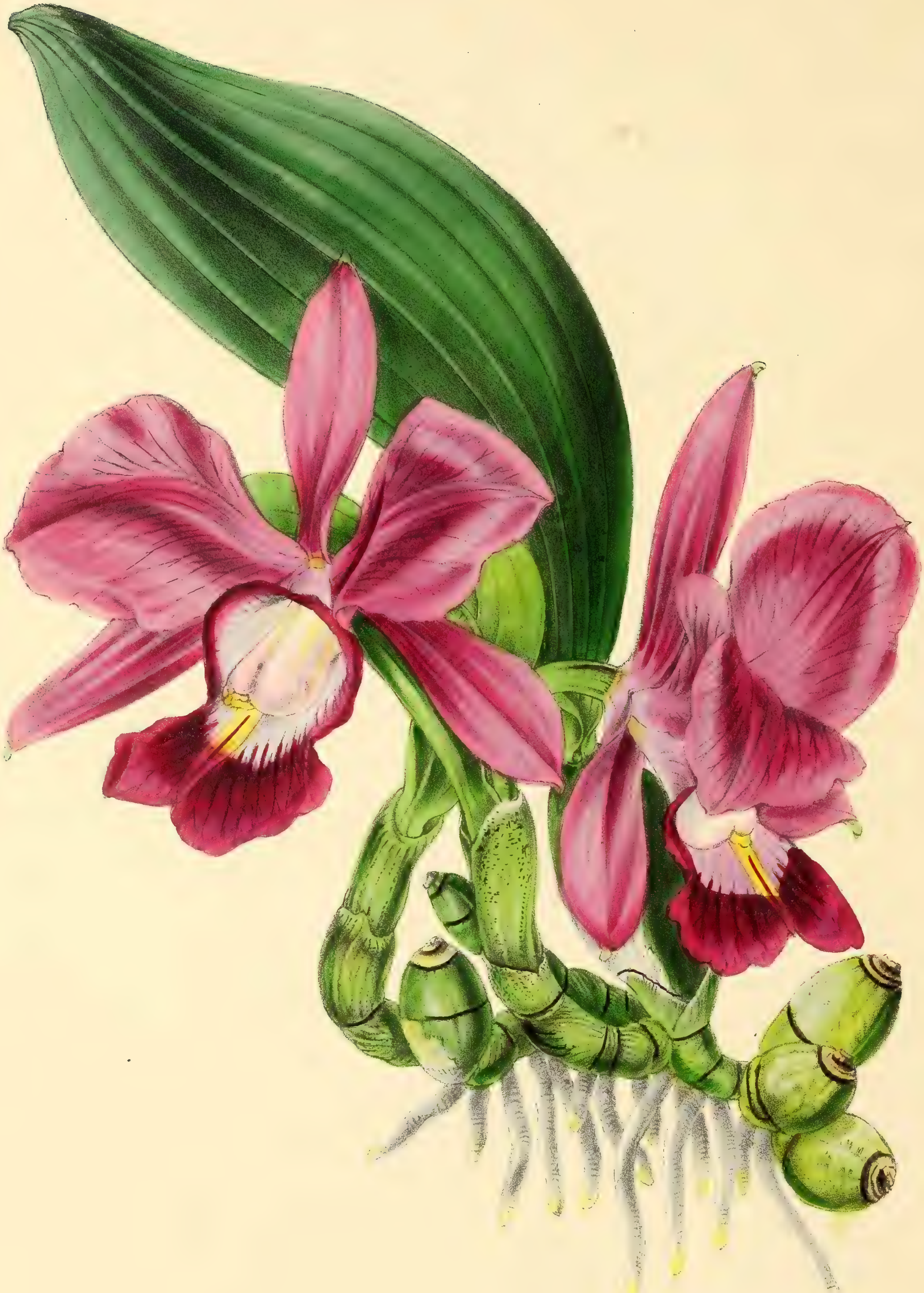
Stove climbers, whether planted out in borders or grown in pots or tubs, should now be well pruned; and the various species of Passion-flower which are intended to produce fruit this coming summer, should be cut in freely, especially *P. quadrangularis, alata, edulis, phœnicea, Buonapartea*, and *laurifolia*. When the buds begin to swell up, repot such as are in pots or tubs, and add a quantity of new soil to those in the borders, as a top-dressing. This is also the proper time to prune the various species of *Lagerstrœmia* which have been at rest during the winter. Cut all the previous year's wood, according to its strength, to within a few eyes of the old branches; the stronger shoots to two or three eyes, and the weaker ones to within one or two eyes. When this operation is finished, the plants will have a naked, stump-like appearance; but the vigorous growth which will follow this treatment more than compensates for the want of ornament and extra trouble which the performance of it entails. The Amaryllidaceous plants must also now have an immediate share of attention. As soon as they show signs of growth, repot, and introduce them into a cool part of the stove, and supply with a small portion of water, increasing the quantity as the plants develop their flowers or leaves. Attend also to *Clerodendrons, Geissomerias, Eranthemums*, and *Erythrinas;* diminish the balls, repot, and start them in a moderate moist heat. Orchids beginning to grow should be placed at the warm end of the house, attend carefully to them with watering, a humid atmosphere, and shading. Many of the plants, on blocks or in baskets, will require syringing two or three times in a week, especially *Gongoras, Stanhopeas*, and *Dendrobiums.* All syringing at this time of the year should be done on sunny mornings, and air should be admitted about mid-day for an hour or two, to dry the moisture from the buds lest they should rot. Flowering specimens of Orchids must neither be kept so warm or moist as those which are growing.

In the *conservatory* and *greenhouse* make slight advances of heat on bright days, but in dull, cold weatber, do it with care; avoid fire as much as possible—it is never beneficial to greenhouse plants, except to prevent the effects of frost. Keep up a free circulation of air whenever the weather will permit, and shut up early in the afternoon, making the air rather humid. The climbers, also, in this department, must be trained as they advance in growth; for if they once become entangled, they can scarcely ever be regulated satisfactorily during the whole season afterwards. *Potting* is now a daily business: use fibrous soil, give good drainage, do not water newly-potted plants too heavily, or remove them whilst fresh watered, for if much shaken the soil becomes sodden and heavy, and the free growth of the plants is retarded. Large specimens of Fuchsias may now be placed in their flowering pots. *Cape bulbs* should be potted—a mixture of leaf-mould, loam, and sand, is the best soil—and give good drainage. *Ericas* will also now many of them require shifting; use good sandy heath-mould, with lumps of charcoal and broken freestone mixed through it, and lay abundance of crocks for drainage. This, too, is the best time to sow exotic seeds; sow on a smooth surface, and cover with a little finely-sifted mould, composed of peat, loam, and sand, and cover each pot with a little moss to obviate the necessity of often watering. *Rhododendrons, Azaleas, Acacias, Epacrises*, and many other plants, will now be in a blaze of blossom, and will render the conservatory most interesting.

In the forcing-pit, still continue to replace plants which have come into bloom with others which are to succeed them. Look well after insects, or they will soon destroy all your hopes; fumigate where necessary, and syringe often.

In the cold pits and frames, expose the plants as much as possible to the open air, when not frosty. Hardy and half hardy annuals are all the better for being sown in pots and placed in these situations until the spring frosts are over, and if then turned into the borders in a mass, they will make a fine show before the autumn flowers, as *Verbena*, &c., come into bloom.

In the open flower-garden vegetation is progressing. Mowing and dressing lawns should begin in good time, that a close surface may be obtained before hot dry weather commences. Prune roses; continue to prepare flower-borders and beds from the cold pit; and progress as fast as possible with everything the weather will permit.



S. Holden. del. & Lith.

Cattleya bulbosa.

CATTLÈYA BULBÒSA.

(Bulbous Cattleya.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

Generic Character.—*Sepals* membranous or fleshy, spreading, equal. *Petals* frequently larger. *Labellum* cucullate, enwrapping the column, three-lobed or undivided. *Column* club-shaped, lengthened, semi-terete, margined, articulated with the labellum. *Anthers* fleshy, four-celled, with the margins of the septæ membranous. *Pollen-masses* four, caudiculæ bent back, even.

Specific Character.—*Plant* an epiphyte. *Stem* consisting of oval, short pseudo-bulbs. *Leaves* oval, short, leathery, solitary. *Peduncles* one-flowered. *Sepals* linear-lanceolate, obtuse. *Petals* twice the breadth of the sepals, waved at the edges, oval, membranous. *Lip* flat, shovel-shaped, obscurely three-lobed; *lateral lobes* short, rounded, and undulated; middle one large, wedge-shaped, slightly-reflexed, two-lobed and undulated. *Column* about half an inch long.

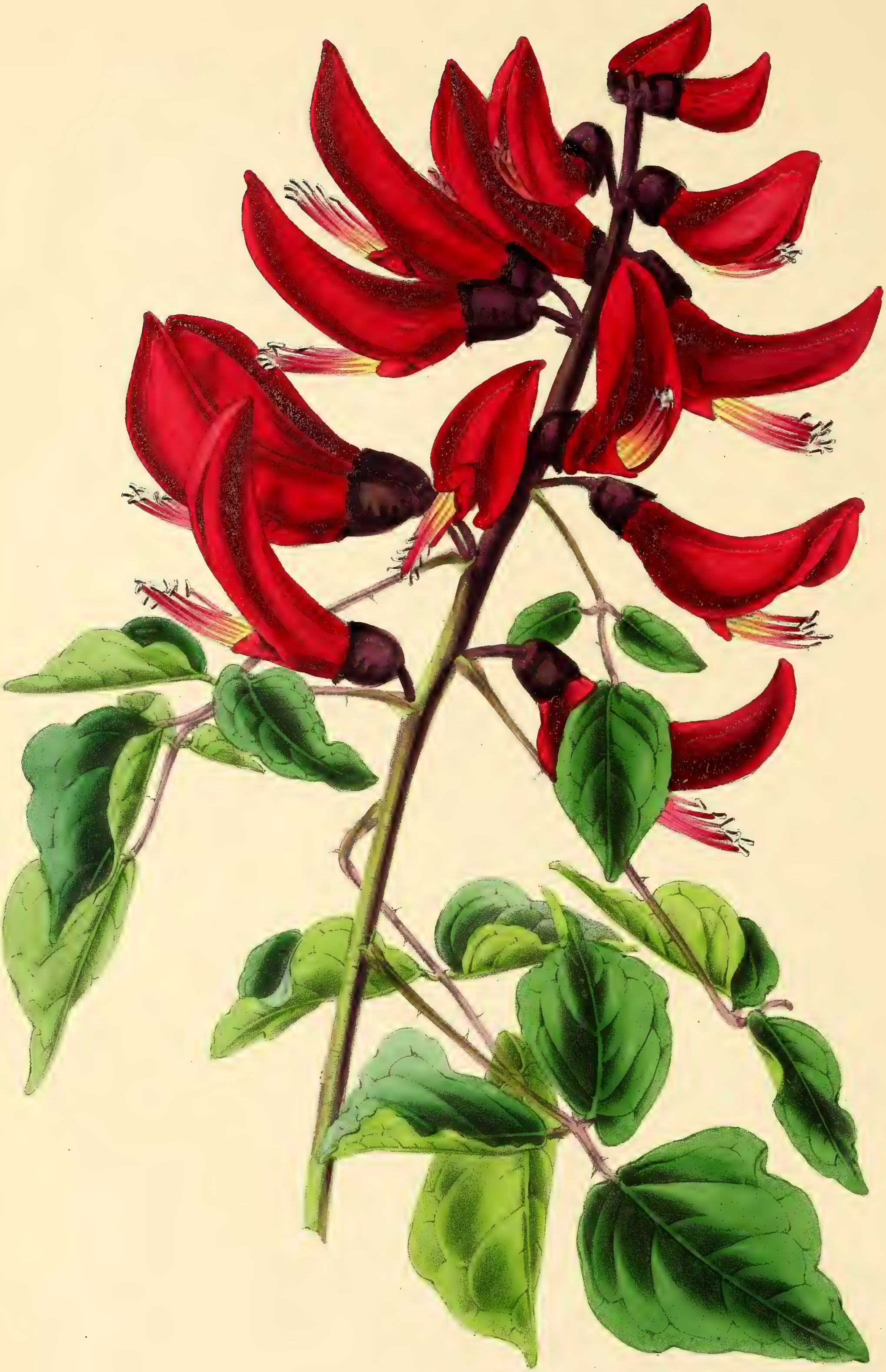
Although *C. bulbosa* is of slender growth, forms a plant in every respect of small size, and is certainly inferior, in point of grandeur, to some of the other species which have been figured in our "Magazine of Botany," yet it cannot by any means be considered an inferior member of this beautiful genus. The flowers, although not more than one-fourth of the size, possess much of the brilliancy, colour, and delicacy of *C. labiata*, Vol. iv., t. 121.

It is supposed to be a native of Brazil; but by whom, and at what period introduced, is uncertain. It flowered in the splendid collection of Mr. Rucker, who is undoubtedly the best grower of Orchids in this country, during June 1847, when our drawing was kindly permitted to be made.

This species, like all other Cattleyas, is easily cultivated, provided it be not subjected, during the growing season, to too much heat and moisture, and over-watering during the period of torpidity. Indeed it requires very little water, even during its most vigorous growth, and always suffers if exposed to syringing.

It is increased more readily after the plant has commenced its growth, instead of, as in most other Orchids, whilst in a state of rest. It should be potted, after the manner of *Stanhopeas*, in turfy peat, sphagnum, and potsherds. This is preferable to fixing on a block.

The generic name is given in honour of the late William Cattley, Esq., of Barnet, Hertfordshire, once a patron of Botany, and one of the most ardent collectors of rare plants of his day.



S.Holden del & Lith.

Erythrina Bidwillii.

ERYTHRÌNA BIDWÍLLII.

(Mr. Bidwill's Coral Tree.)

Class.
DIADELPHIA.

Order.
DECANDRIA.

Natural Order.
LEGUMINÀCEÆ.

Generic Character.—*Calyx* tubular, with a truncate subdentate mouth, or spathaceous. *Corolla* with a very long oblong vexillum. *Wings* and dipetalous *Keel,* much shorter than the vexillum. *Stamens* diadelphous, straight, the tenth one adhering more or less to the rest, but sometimes free. *Legume* long, torulose, many-seeded, two-valved. *Seeds* ovate, with a lateral hilum.

GARDEN HYBRID.

From Messrs. Veitch and Son, of Exeter, we received the specimen from which our drawing was made of this very beautiful hybrid. The late Dean of Manchester, in a communication inserted in the " Botanical Register," vol. xxxii, t. 9, states it to have " been raised from *E. herbacea,* impregnated by *E. Crista galli,* and is considered remarkable as being the only certain hybrid papilionaceous plant we have. It is a beautiful kind, of intermediate habits. Its vigorous shoots die down to the roots after flowering, and have leaves of an intermediate form, approaching in colour and gloss rather to those of *E. herbacea.*

" The flowers are intermediate both in size and colour, but, like those of *E. Crista galli,* borne by threes at the axils of the leaves, as well as on a terminal spike, while those of *E. herbacea* are borne on a leafless spike, proceeding from the root."

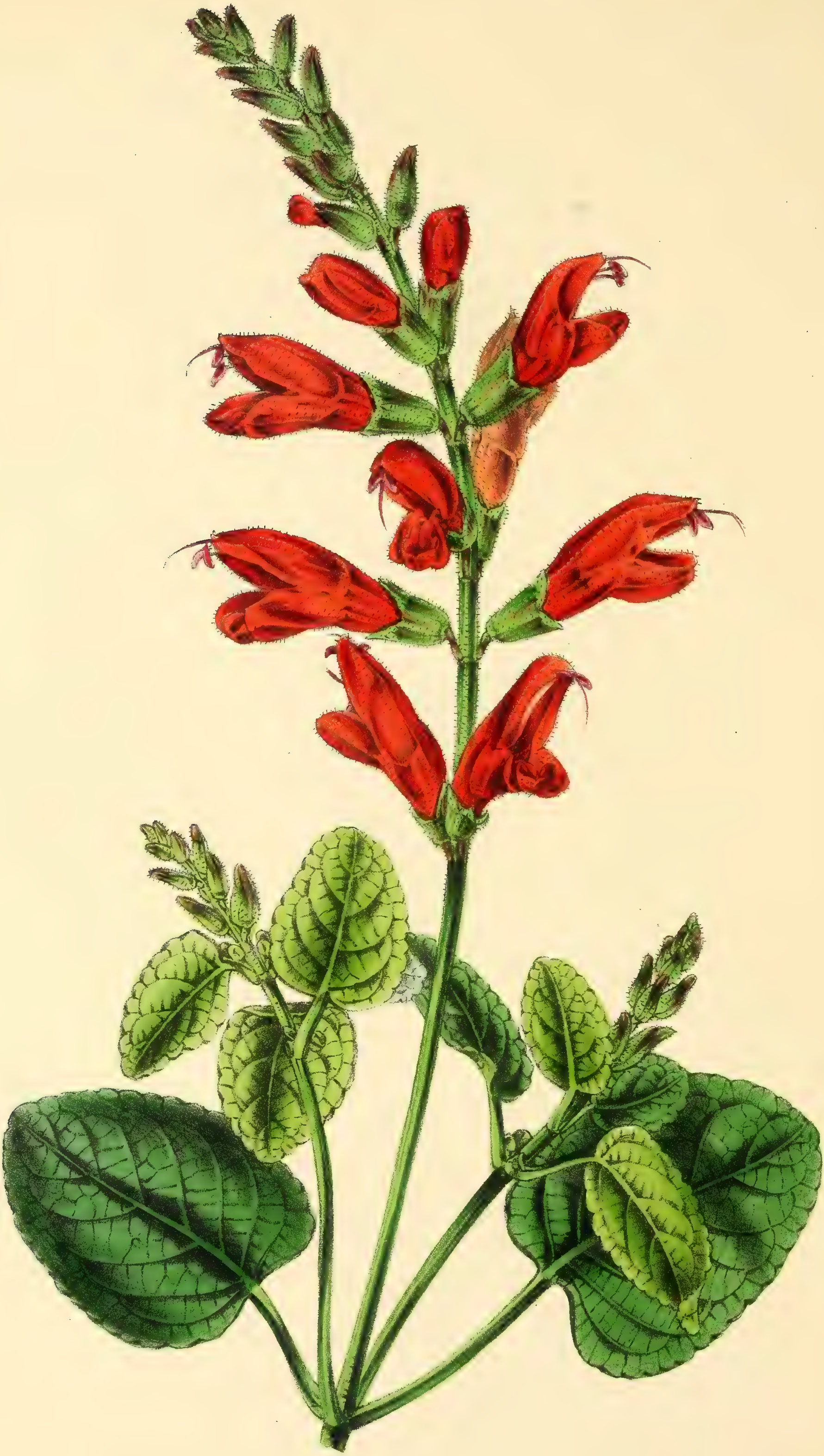
All the coral trees have handsome foliage, and rich showy flowers. They deserve to have a place in every collection of stove plants; especially as they are easily managed, and grow freely in any light, rich, loamy soil.

Some of the species do not, however, produce their flowers freely, but these may be brought into bloom by being grown vigorously in strong heat and moisture: when they have lost their leaves, withhold water at the roots, giving no more than just sufficient to prevent their perishing with drought. After they have begun to grow again, administer water more freely, and, by this treatment, they will usually produce their flowers profusely.

E. laurifolia and *E. Crista galli* will thrive, and blossom freely, planted out in the open border, in a sheltered situation. The tops die down to the surface every winter; the dead parts should then be cut off, and a large flower-pot placed over the roots, to prevent injury from frost and excessive wet.

Cuttings of all the species strike freely, if taken off at a joint, and planted in sand, under a glass in heat.

The generic name is derived from *erythros*, red, in allusion to the colour of the flowers, and the specific name in honour of Mr. Bidwill.



S. Holden, del & Lith

Salvia oppositiflora.

SÀLVIA OPPOSITIFLÓRA.

(Opposite-flowered Sage.)

Class.

DIANDRIA.

Order.

MONOGYNIA.

Natural Order.

LAMIACEÆ.

(Labiates, *Veg. King.*)

Generic Character—*Calyx* ovate, tubular, or campanulate, bilabiate; upper lip entire, or tridentate; lower one bifid: throat naked inside. *Corolla* with an inclosed or exserted tube, which is equal, ventricose or widened, sometimes furnished with a ring of hairs inside, sometimes naked, or furnished with two teeth or processes on the lower side at the base; limb bilabiate; upper lip erect, rarely spreading, straight or falcate, entire or emarginate; lower lip spreading, shorter or longer, with the lateral lobes oblong or roundish, spreading, reflexed or twisted erectly, the middle lobe usually the broadest, entire or emarginate. *Rudiments* of superior stamens wanting, or small and club-shaped; lower two always fertile, inserted near the throat of the tube; filaments short, horizontal, rarely erect, articulated with the anther at the top, and usually drawn out beneath the articulation, rarely almost continuous. *Anthers* dimidiate; connective elongated, linear, articulated transversely with the filament, ascending under the upper lip of the corolla, and bearing at the top a linear, adnate, or versatile fertile cell, and deflexed or erect behind, and sometimes bearing another smaller cell, which is either fertile or difformed, and empty; free, but usually combined together, or connate in various ways. *Disk of Ovarium* glanduliferous in front. *Style* ascending, bifid at top; lobes sometimes subulate, equal, or the superior one the longest, and sometimes the lower one or both are rounded, dilated and flattened. *Stigmas* for the most part minute, terminal, or in the larger part running along the lobes of the style. *Achenia* ovoid-triquetrous, dry, glabrous, usually very smooth. —*Mag. Bot.*, v. xii. t. 31.

Specific Character.—*Plant* shrubby. *Stem* procumbent at the base. *Branches* erect, pubescent. *Leaves* petiolate, ovate-oblong, obtuse, somewhat cordate at the base, green on both surfaces, wrinkled, pubescent, an inch-and-a-half long; floral leaves ovate-lanceolate, deciduous. *Racemes* simple, elongated. *Whorls* secund, two-flowered. *Flowers* orange-red. *Calyx* tubular, striated, two-lipped; upper lip entire, teeth of the lower lip ovate, acute. *Corolla* four times the length of the calyx, pubescent outside; tube three times the length of the calyx; lips nearly equal.

Authorities and Synonymes.—Salvia, *Linnæus, and many other Botanists.* Stenarrhena, *D. Don, Prod. Fl. Nep.* Horminum, Sclarea, and Œthiopis, *Tournef., Inst.* and many others. Salvia oppositiflora, *Ruiz et Pav., Flor. Peruv,* i. p. 26, t. 43. Salviagrata, *Vahl, Enum.* i., p. 244.

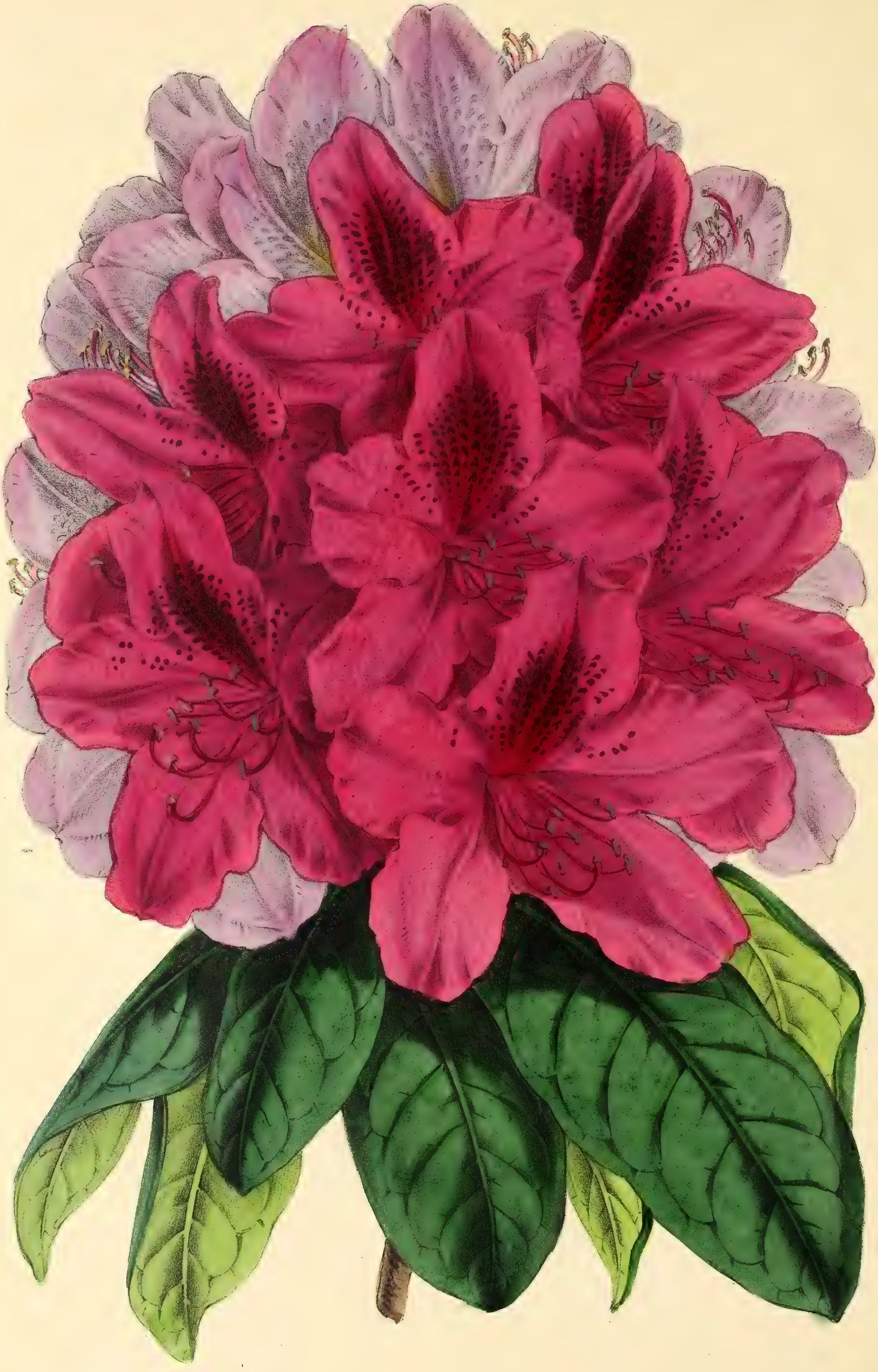
This very beautiful species of Sage is a native of Peru, whence it was introduced a short time ago by Messrs. Veitch and Son, Exeter. Their collector found it growing in elevated and exposed situations, where it was subjected to little moisture and considerable aridity.

It flowered in November last, when our drawing was made. The whole plant emits a pleasant fragrance, which however becomes too powerful when the plant is handled.

It is a hardy greenhouse plant, requiring to be potted in a rich light loam, or a mixture of loam and peat. It is readily increased by cuttings of the young wood taken off at a joint, and planted under a hand-glass in heat.

Specimens flowered freely with Messrs. Veitch and Son, for several months during last summer in the open ground, and it will probably prove an excellent kind for bedding out in the flower garden.

The generic name is derived from *Salvo* to save, on account of the supposed medicinal qualities of some of the species.



S. Holden, del. & Lith.

Rhododendron Standishii.

RHODODÉNDRON STANDÍSHII.

(Mr. Standish's Rose Bay.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
ERICÀCEÆ.

Generic Character.—*Calyx* five-parted. *Corolla* somewhat funnel-shaped or campanulate; rarely rotate or five-parted; limb five-cleft, somewhat bilabiate; upper lip the broadest, and usually spotted. *Stamens* five to ten, usually exserted, declinate; anthers opening by two terminal pores. *Capsule* five-celled, five-valved, rarely ten-celled and ten-valved, with a septicidal dehiscence at the apex. *Placentas* simple, angular. *Seeds* compressed, winged.—*Don.*

Standishii.—A hybrid shrub, of dwarf habit.

All our readers are familiar with the magnificent *Rhododendron arboreum* of the Himalayan mountains, figured "Mag. Bot." Vol. i. t. 101; and yet, splendid as is that plant, it is surpassed by some of its Indian varieties. One of these (a white-flowering one) the *R. arboreum fimbriatum*, was figured Vol. ii. t. 98, and another (a crimson one) the *R. arboreum Paxtoni*, we figured Vol. xiv. t. 99. This last, when in bloom, is a perfect model of beauty, and its immense trusses, when the flowers are fully expanded, present to the eye one continued blaze of colour.

None of the above, however, are hardy; and although hybrids have been raised between *R. arboreum* and some of the hardy American species, several of which are certainly very fine, and bear the open air of this country well, yet the season of their flowering is too early for our climate; the spring frosts generally destroying the whole or a part of the blossoms as soon as they expand; the young growth also very often becomes so damaged that few, if any, flower-buds can be perfected.

The above reasons induced many cultivators, and amongst them Mr. John Standish, of Bagshot, to try and produce a hybrid with the splendour and colour of *R. arboreum*, the hardiness of *R. ponticum*, and flowering late so as to escape injury from the spring frosts; after making the subject his study for the last ten years he has happily succeeded beyond his highest expectation. His crosses have been betwixt the latest American sorts for the female parents, and the highest coloured alta-clerense for the males. This union has produced some perfectly hardy free-blooming and high-coloured varieties, ranging from rose to deep crimson; and such free bloomers, that one only 13 inches high has at present no less than 20 flower-buds upon it. They are also good growers, with fine handsome foliage, and their time of blooming was, last year, from the 20th of April until the 2nd week of June.

The subject of our present plate is a hybrid betwixt *R. maximum* and *R. altaclerense.* Mr. John Standish sowed the seeds, and the plant flowered when five years old, and was only 15 inches high; but it bore 8 large trusses of fine flowers. It is perfectly hardy, having been out in the open ground ever since it was a seedling, and has never been injured by frost.

The flowers are rather larger than those of *R. ponticum*, but are disposed in trusses of a very superior size. The habit of the plant is dwarf and spreading, and the leaves are of a deep glossy green. The violet-crimson of the flowers can scarcely be imitated by art, and the throat and upper divisions of the corolla are freely spotted with black.

The name is derived from *rhodos*, a rose, and *dendron*, a tree.

SOLAR LIGHT AND ITS AGENCY.

Every fact that bears upon the inductive theory of vegetation ought to be collected and reported in a work like the present, as tending to exalt and verify its science. We (the writer of this article) cannot vouch for the impugnable correctness of the statements of which some abbreviated extracts will now be presented to the reader; but, at all events, as the subject of *scorching* through the medium of the British and German sheet glass has been much canvassed of late, it will be interesting to recur to it, and to the remedy proposed.

A paper was read by Mr. Hunt before the Society of Arts, on the 16th of February last, " On the principles upon which the tinted glass used in the construction of the Royal Palm-house at Kew, has been selected, and the use of coloured media in the cultivation of plants." German sheet glass is distinguished by its freedom from colour, and has been found to produce scorching in particular solar aspects. " This has been observed in a striking manner in a hothouse for Orchids and Ferns, erected in the Kew Gardens." The phenomena alluded to were the more likely to take place when the medium through which the solar rays must pass was peculiarly transparent, and especially when the full power of the white, or combined rays, should thus freely act upon some plants which by nature are produced in dark and sombre recesses of tropical climes, wherein the atmosphere is vaporous, and tainted with the gaseous exhalations of decaying vegetable matter.

Mr. Hunt commenced by stating that, " having furnished a report to the Commissioners of Woods and Forests," he was requested to renew his experiments with a view to ascertain " whether any *tinted* medium would protect the plants from scorching, without interfering with those influences upon which their healthful vegetation depended." The Royal Palm-house is now glazed with such tinted glass.

We have, on a former occasion, made some slight mention of the chemical principle of light, which has received the title of *Actinism*, evidently derived from the Greek word *ακτὶν*, a sunbeam or flash of lightning. In describing some of his experiments, Mr. Hunt remarked that " the solar beam was now well known to give rise to three distinct classes of phenomena." These were, first, the production of *colour* and sense of vision; second, *heat*, upon which depends the present condition, as regarded solidity or otherwise, of all terrestrial substances; and third, a chemical agent, to which the name of *actinism*, or ray of power, had been given.

If by *power*, the lecturer meant to imply the power to decompose or to form combination, he might be so far correct, otherwise the word has no reference to force of power in the abstract.

" Physical investigation had made us acquainted with many of the laws regulating light and heat; but in relation to photography few inquiries had been made into the phenomena of actinic force." Three diagrams were then produced; the first exhibited the passing of a pencil of solar light through a prism, by which the three primitive colours and their blendings were displayed; the second showed the effect produced by the same spectrum upon blackened paper marked with ether, by which means it was ascertained where the heating power of the sunbeam resided; a third represented the chemical change produced by the same prismatic image when thrown upon nitrate of silver or any of those sensitive photographic preparations which were susceptible of chemical change under solar influence.

The phenomena are described "as arising from the different degrees of refrangibility in these subtile principles." These principles, it is true, are coincident with varying refraction; but judging from effects, we may be pretty certain that they are in their nature essentially independent. As to *actinism*, it appears to combine the chemical powers of electricity and magnetism, as they exist in the solar beams.

"Further experiments," says Mr. Hunt, "have proved that although light was injurious to the germinating seed, and actinism a most powerful accelerating agent in that process when the first leaves were developed, the actinic principle, as separated from light, became too stimulating, and that the luminating principle was then demanded to effect in the plant the decomposition of the carbonic acid inhaled by the leaves and absorbed by the bark, (*liber*), and the secretion of carbon (as the principle *lignin*), to form woody structure." The influence of heat, and its necessity to vegetable life, were well known; "but it had also been proved that as the calorific rays increased towards autumn, the luminous and actinic relatively diminished; the scorching effects to be prevented were the result of some of the *heat* rays, and he had discovered to which class they belong, *by spreading the expressed juice of Palm leaves over paper, and exposing it to the action of the spectrum.* This class of ray had the power of acting partly by the force of heat, and partly by chemical agency."

It appeared to Mr. Hunt, that in adopting any *tinted* glass, care should be taken that neither light nor actinism be intercepted. The desideratum required was a peculiar kind of green glass which should intercept only the scorching rays, without obstructing those of ordinary heat-light and actinic power. Mr. Hunt, therefore, aided by the contractor for the Conservatory, procured green glasses of every variety of tint, but they were all found objectionable. He then experimented with fluids, diluting the colours to any degree, and examining the absorbing power of a great variety of chemical bodies. By this means he discovered a colour produced by oxide of copper, in a very diluted state, which would effectually obstruct the scorching rays; and Messrs. Chance and Co., (of Birmingham) after many trials, succeeded in producing a glass which neither obstructed light, nor interfered with the colour of the most delicate white flowers, nor excluded the passage of the chemical rays, while it would completely prevent the permeation of those *heat* rays, which were found to have so remarkable a scorching quality. In the manufacture of this glass, the entire *absence of manganese*, though used in the ordinary construction of glass, had been insisted on, because that mineral when used in the slightest excess, had the curious property, when under the influence of light, of imparting a pink tinge, and the slightest approach to redness would allow the free passage of those rays it was so important to obstruct.

Mr. Hunt is the author of those scientific papers on "*The Physical Powers of the Universe*," which have, during a considerable period, been published in the "Pharmaceutical Times." His writings are doing Science good service; and now, this paper upon the "*Effects of Light in Plant-houses*," widely disseminated as it will be in the columns of the "Gardeners' Chronicle," will tend to improve the practice of plant-culture. Reference may also at any time be made to the great example thus furnished at Kew.

The theory thus advocated, leads to one remark upon the effects of coloured glass. If the *blue ray* be the agent of magnetism, and the *red ray* be the medium of electricity, while rays invisible, but still adjoining those red rays, possess a yet greater heating power, may we not presume that the two produce those chemical effects which correspond with electric polarity? The subject claims the utmost attention. To conclude our extracts, the following is given verbatim:—

"From the facility with which we were enabled to regulate the use of coloured media, the quantity of either light, heat, or actinism, which may be admitted to growing plants, we had the command of means of supplying the increased action of any of these forces. Germination might be quickened by the action of the actinic power, independently of light, and the full action of *chemical rays* was secured by the use of glasses stained *blue* by *cobalt*. In all cases the germination of seeds may be quickened by covering them with such blue glass as was used in making many finger-glasses; and since the striking of cuttings was dependent upon the exercising of an analogous force to that which quickened germination, similar glass shades would be found to effect this object. It must, however, be remembered that the excitement of that chemical agent must be withdrawn after germination has been effected, the roots formed, and an independent existence given to the plant."

It is to be regretted that the agent of actinic force is not more clearly defined: judging, however, from the closing hypothetical paragraphs, the curious reader may be enabled to infer that the actinic rays are not luminous; for we read, that "the absence of luminous rays in considerable quantity, and a diminished quantity of the chemical or actinic radiation might be secured at will without interfering with the heat-giving principle, by the use of glasses coloured red by the oxide of gold." But this red tint, even the pink hue from manganese referred to above, would seem to compromise the principle advocated throughout, namely that of excluding the scorching agency. Great difficulty is involved every way! Again it is stated that the yellow glasses obstructed the chemical rays, but would intercept very little light: therefore, "when there was any tendency to form too much stalk or leaves, and it was desired to produce more wood, it was done by admitting as much light as possible, with the smallest possible quantity of actinic power, and that might be effected by interposing glasses of a yellow tint."

It is evident from all we see and read, that at present we have merely approached the threshold of natural philosophy. The mind has attained some glimmerings which point to truth; but it wanders discursively from theory to theory, as here and there a discovery has resulted from some fortunate experiment. The spirit of research is, however, roused; and, if persisted in, may produce results of practical utility. As to glass, pending further inquiries, the wealthy man may adopt the green tinted medium that has been employed at Kew. The more humble amateur must be content to avoid expensive white glass, and trust to the shade of some delicate fabric, of rather open tissue, which shall produce a softened, diffused light, throughout the few mid-day hours of brilliant sunshine which are experimentally found to scorch the foliage, and scald some of the fruit near the lower surface of the glass. We have not profited much by the clear and beautiful glass lately introduced, and it is more than probable that the green-tinted glass of former years was productive of less injury than is the medium now so fashionable, and which facilitates the passage of all the rays in the form of pure, white light. Strength and substance have been obtained, and so far breakage by hail has been obviated; but little more can be said on the ground of utility.

Since the above was written, the subject has been resumed in the "Gardeners' Chronicle" of March 4. The learned Professor has offered some apposite remarks; but the paper must be referred to.

CULTURE OF THE JAMROSADE AND VARIOUS OTHER SPECIES OF ROSE-APPLE.

The Jamrosade or *Jambosa vulgaris* of modern Botanists, is the *Eugenia Jambos* of the old catalogues, and belongs to the natural order Myrtaceæ, or Myrtle-blooms, of Dr. Lindley's "Vegetable Kingdom." It forms a branching tree-like evergreen shrub, 20 or 30 feet high, with long, opposite, narrow, glossy leaves. Its flowers are produced in axillary, and terminal cymes, from April to June; they are at first pure white, and almost destitute of fragrance; but after a few hours, they become tinged with a slight yellow colour, and acquire a grateful and peculiar smell. The fruit grows to the size of a golden pippin apple, is very sweet to the taste, and emits so powerful a scent of the rose, that a single one laid in any apartment will fill it with its pleasant odour.

The cultivated and wild varieties in the native country of this plant are very numerous, some bearing white, and almost transparent fruit, and others with every shade of colour up to the deepest red; but all possess the same peculiar flavour, and are nearly equally esteemed by the natives.

The plant which fruited at Chatsworth during the summer of 1847, is probably the same variety, which some years ago fruited with Professor Thouin, in the

National Garden at Paris, and has since yielded in several other establishments of this country. The Chatsworth specimen is planted out in the large conservatory, a short distance from the flue, which passes beneath the boarded walk on the western side of the house; from this position it is probable that some degree of heat may more or less affect the roots; in other respects the situation is a cool one, being but a short distance from the part occupied by Seville oranges, and other plants requiring similar temperature.

Our observations of its habits have led us to the conclusion, that a very moderate heat is far more beneficial than the high temperature to which it is in most places exposed. If subjected to the latter treatment, it soon becomes covered with aphis, and filth upon its leaves, even though often washed with the syringe.

It must be remembered that however injurious insects are to vegetation, they rarely if ever, are the primary causes of disease; their attacks always indicate some previous internal interference with the natural functions of the plant, by which the juices are to a certain extent changed, and thus become suitable food for these creatures, which immediately begin to deposit their eggs. When hatched they feed upon the juices of the plant, and thus increase the original disease. If these attacks are of long continuance, unless some foreign aid is administered, the efforts of nature become too enfeebled and paralysed to enable the plants to recover, for that season at least, their usual health and vigour. This subject, however, we can only at present touch upon, and must waive our remarks to a future day, and return to the treatment of the Jamrosade at Chatsworth.

It requires a large surface of soil for its roots, which grow strong and spread to a considerable distance. The soil in which it is planted is a rich but sandy loam. During the season of growth it is syringed freely every fine day, and also receives a good supply of water at the roots; but during the time when the blossoms are expanded, and the fruit setting, syringing is altogether dispensed with; but is resumed again as soon as the fruit begin to swell. It is rather a quick growing tree, if kept clean; our plant is already 15 or 16 feet high, and spreading in proportion, although still quite young.

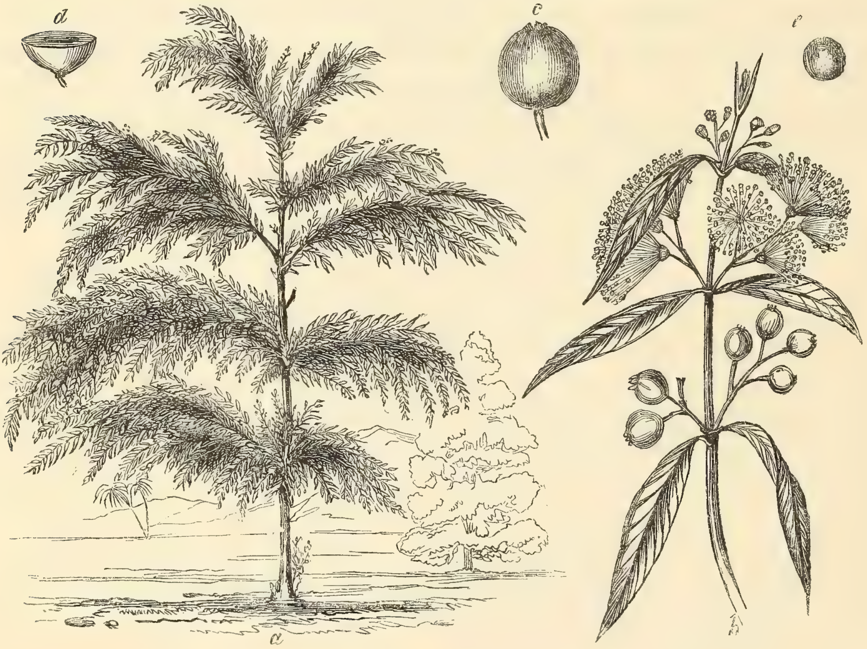
The inflorescence is produced in cymes, each containing five or more flowers, but sometimes from abortion only two. The cymes spring chiefly from the axils of the leaves, on the previous year's wood, but occasionally they are terminal on the young growing shoots of the current year.

The flowers appear large in size on account of the long filaments, which are very numerous and spreading; both these and the small petals are white when they first open, but slightly change to a pale yellow before they fall.

The fruit at first swells slowly until syringing is resumed, then if the plant be subjected to a genial warm and moist temperature, they show signs of rapid progress, and become fully swelled and ripened by the end of July.

The flavour may be likened in some degree to an inferior orange apricot, and the fruit is about the same size; it possesses, however, the fragrance of a rose in a powerful degree; it cannot be considered (at least as we have had the opportunity of eating it), at all equal in flavour to even a very inferior apricot. But unless it was grown in a house intended for the culture of tropical fruits alone, and where during the season of ripening it could be subjected to the usual ripening process to secure flavour, a correct estimate of its merits as a table-fruit could scarcely be given. Our opinion however is, that to render it a really good fruit, more acid than it at present possesses, must by some means or other be obtained.

The fruit, if intended to be eaten, should not be allowed to hang upon the tree until fully ripe; for if this be permitted, they become woolly and insipid, whilst on the contrary, if they be gathered carefully when they have arrived at their full size, colour, and fragrance, and are placed for a few days in a hot, dry, sunny temperature, they become more sugary, their flesh instead of being woolly is melting and luscious, and their flavour is certainly much improved.



DESCRIPTION OF THE WOOD-CUT.

a The appearance of the *Jambosa vulgaris* when in fruit at Chatsworth in July, 1847.

b A detached branch, to show the inflorescence and the fruit in a young state.

c The appearance of the fruit when ripe, one-sixth of its natural size.

d The fruit cut open to show the seed in the centre.

e The seed covered with its indusium.

The before-mentioned particulars respecting the Jamrosade grown at Chatsworth would suggest for its cultivation as a table-fruit the following rules:—

1. The temperature for its growth and fruiting should be a moderate but moist

stove heat; and its roots should have access to a little bottom warmth, but not in such a degree as to dry and parch the soil.

2. During the season of torpidity the temperature should not be allowed to fall very low: perhaps 60° would be a fair average. It ought never to exceed 65°, or fall lower than 55°.

3. If grown in pots or tubs abundance of root-room should be given, otherwise a stunted growth is sure to follow. If at all convenient, it is best to plant out in a prepared border.

4. If planted out, a rich light loamy soil is the best, and no other addition is requisite; but if grown in pots or tubs, a mixture of two parts light rich loam, and one part very rotten manure should be used.

5. Good drainage is essential wherever grown: any stagnation of water soon paralyses the energies of the roots, and renders the plant unhealthy.

6. During the season of growth, water liberally at the roots and syringe freely every fine day; at the time of flowering and fruit-setting this should be discontinued, but renewed again when the fruit commences to swell.

7. When the fruit is full grown and begins to ripen, wet the tree as little as possible and admit a good supply of fresh air every fine day; this will assist in producing a good flavour.

8. Gather the fruit carefully from the tree a day or two before they become ripe, and expose them in a warm, dry atmosphere, to the full influence of the sun, until they are fully matured.

9. For increase, plant cuttings in spring in pots of sand, and place them under a glass in a moist heat.

Many other species besides the Jamrosade are cultivated by the natives of the countries where they are naturally found. Amongst these may be mentioned—

THE MALAY APPLE (*J. Malaccensis*), which perhaps bears the best fruit of the whole, but has not yet borne in this country. We cannot say what its merits may be when subjected to our mode of culture. It forms in its native habitats a tree 30 or 40 feet high, with leaves 14 or 15 inches long, and 5 or 6 broad. The fruit is ovate, an inch and a half in diameter, and very agreeable to both taste, smell, and sight. It requires more heat than *J. vulgaris*, but in all other respects may be treated the same.

THE PURPLE ROSE-APPLE (*J. amplexicaulis*).—Mr. Gibson, who, whilst in India collecting plants for His Grace the Duke of Devonshire, ate most of the kinds of rose-apples, considered this purple-fruited preferable to the others; it grows rather larger than the Jamrosade, although scarcely equal in size to some of the varieties of Malay apple. Its treatment is in every respect the same as the *J. vulgaris*.

THE ROSE-WATER JAMBU (*J. aquea*) is the same in habit and appearance as the *J. malaccensis;* its fruit contains a deal of juice, highly impregnated with the fragrance of roses; hence its name. Treat it like the *J. malaccensis.*

The Jabuticuta or Jabaticarburas (*Eugenia cauliflora*) is another, and one of the best of the Rose-apples; it deserves a place amongst fruit-bearers, and may, perhaps, by cultivation be rendered a superior fruit. Its treatment is the same as *J. malaccensis.*

The White Forest Rose-Apple (*J. sylvestris alba*) is most likely the true Schambu of Malacca and Java. It is the *Eugenia Jambos* and *Jambosa vulgaris* of some authors, and is thought to be a white variety in a wild state. Its fruit is said to be much the same in every respect except size (this being a little smaller) to that of *J. vulgaris.* Its treatment in cultivation is also the same. The wood of this plant is more esteemed than the fruit; it grows crooked and knotty, and forms excellent ribs for shipping, a use to which it is much appropriated.

The Large-leaved Rose-Apple (*J. macrophylla*) resembles very much in appearance the Malay Apple but differs both in its flowers and fruit. It must be treated like *J. malaccensis.*

The Handsome Rose-Apple (*J. formosa*) resembles *macrophylla:* is said to bear a good fruit, and to be worth cultivating. It is a very ornamental plant, and may be grown like *J. malaccensis.*

Several other species are perhaps fully equal to any of the above; but as we have no direct evidence of their respective merits, we can do no more than mention a few of their names:—

The Cayenne Cherry (*Eugenia Michelii*), the Bastard Guava (*Eugenia pseudopsidium*), the Jambon (*Jambosa densiflora*), the Kupa (*Jambosa cauliflora*), the Kikangar (*Jambosa lineata*), and the Cogaiteira (*Eugenia dysenterica*). As most of these are already in this country, if the attention of cultivators generally was turned towards their treatment as fruit trees, the real value of each might soon be proved.

THE GENUS KALOSANTHES.

This family of beautiful flowers (from *kalos*, beautiful, and *anthos*, a flower) is a native of the Cape of Good Hope, and belongs to the natural order Crassulaceæ. Until succulent plants were re-arranged by Haworth Kalosanthes belonged to the genus Crassula. They are, however, less succulent in their character, and, in a decorative point of view, of considerably more value to the culturist. Within the last four or five years, they have been brought very prominently into notice at the July Metropolitan Exhibitions, and now they are very extensively cultivated by the leading gardeners of the country, both for exhibition and decorative purposes. As flower-garden plants, too, they are of considerable value, blooming at a season when the aristocracy return to their country seats in the autumn; being, when well-grown and properly grouped, remarkably gorgeous in appearance; and, what is of equal consequence, deliciously sweet-scented in the open air, though their fragrance is rather too strong for the confined atmosphere of the drawing-room.

In their native country they doubtless occupy open and elevated situations, where, being exposed to an almost vertical sun, and intense light, they not only bloom profusely, but produce flowers of very brilliant colour. In this country, until within the last ten years, the Kalosanthes were treated as dry stove plants, and we recollect the time when they used to be potted into brick rubbish and very poor soil, and be kept very dry during the winter season, to prevent their rotting or damping-off just above the surface of the soil. In those days, plants were tortured into a miserable existence, and the wonder is now, that more did not pass out of cultivation, than the plant catalogues show to be lost to the country. Merely to have a plant, no matter whether it was enticed to live for years in a 4-inch pot, or got a shift annually on a certain day, was the sole ambition of the botanical collectors of those days, just as it is the pride of some of the antiquated cultivators of the present times.

The whole of the plants belonging to this genus are readily propagated by cuttings, and indeed if the plants are in free growth, and in a tolerably moist atmosphere, it would not be difficult to take the cuttings off with roots to them, as they frequently, when growing freely, produce roots in abundance along the branches. However, supposing you cannot get your plants in this way, cuttings may be taken off any time between February and October, and will then strike freely. In length they should not exceed two or three inches, and must be prepared by removing the leaves from three or four of the lower joints, and then cutting close under the lowermost one in the usual way. If the wood is very succulent or tender, the prepared cuttings had better lay for a few days in a dry situation to evaporate some of their juices, but if the wood is tolerably hard, they may be inserted in the cutting pots at once, giving them an open porous soil, freely intermixed with coarse sand. Place the pots on a gentle bottom-heat, but it is not necessary that they should be kept either moist or very close. They will root and be fit to pot off in about a month or six weeks. After the end of April it is not necessary to strike the cuttings in pots, as from that time until the end of September, they, in favourable situations, strike freely in the open ground. At that season tolerably strong branches may be taken off, and being inserted in a shady situation in the open ground, or temporarily shaded for a short time, they make strong plants for potting in the autumn ; and if they are properly ripened, make good plants for bedding in the flower-garden in the following season.

The soil in which the Kalosanthes most delight is one of free open texture, consisting of—

Two parts rich, turfy, sandy loam
One do. do. do. do. peat
One do. half-decomposed leaf-mould

liberally intermixed with coarse sand and potsherds, and charcoal broken small.

This soil must not be much broken, but must be used in a rough state; indeed, it is not a bad plan to remove some of the finest portions of the loam and leaf-mould by passing it through a fine sieve, before adding the sand and potsherds to the compost. Plants sufficiently strong for stock or flower-garden purposes may be grown in 4 or 6-inch pots, into which, if they are strong and well-rooted, they may be potted at once, but if they are weak, they will be better in smaller pots.

Now supposing that the young plants when first potted have only a single shoot, preparation must be made to induce them to become bushy. This will be effected by decapitating the young plant at the height of three inches, removing at the same time three or four tier of the uppermost leaves, to facilitate the breaking of the branches. Each plant will now produce from four to eight branches, which may either be left to bloom, or, if specimen plants be wanted, be again shortened in when six inches long to about four inches, removing the leaves as before, and regulating the branches so as to have the young shoots regularly distributed over the surface of the plant. If the plants break very freely, it may be necessary to remove or thin out some of the weaker shoots to prevent crowding, as, if it is intended to grow the plants to a large size, something like the annexed vignette, it is not advisable to have the shoots too much crowded at the commencement. A plant in an 8-inch pot, with ten or twelve good strong shoots, may be considered a good start; supposing you have such a one at the present time, the following will be the method to pursue in the first season:—Towards the end of February, stop the shoots and remove the leaves as before directed, and keep the plant in a warm part of the greenhouse until it has made shoots an inch long; then repot it into a 12-inch pot, using the same compost as before, and return it to the greenhouse, placing it in a warm airy place close to the glass. Here it will remain until the greenhouse plants are placed in the open air, when it may be placed in a sheltered situation, but fully exposed to the sun. When the pot is full of roots, the plant may be watered occasionally with very weak liquid manure, but care must be taken not to give it too much or too frequently. If it is intended to bloom the plant next year, it must not be stopped after the spring stopping, and it will then produce from twenty to thirty-five fine heads of bloom; but if it is wished to make a fine specimen, and not to bloom it until the third year, it must be stopped again the end of July, and also in the February of the third year. Supposing, however, that it blooms in the second year, it must towards the end of August, after the flowers have faded, be cut in rather severely, and be again started to make wood, to bloom in the fourth year. Plants of Kalosanthes rarely bloom well two years consecutively; but if half the bloom buds are taken off in the second year, then a succession of wood will be produced which will bloom every year.

In potting the Kalosanthes, it is advisable to use the "West Kent Pot" made by Pascall of Chislehurst, as the plants being very heavy, it is dangerous as well as inconvenient to reverse them so as to turn them out of the ordinary pots. The West Kent Pot, though not quite new in form, is an exceedingly useful invention for removing large specimens, as by merely placing the pot on a block, the ball is thrust out, and may either be repotted or be examined and returned to the same pot, and that without any fear of doing the plant injury. It is strongly to be recommended for large specimen plants of all kinds.

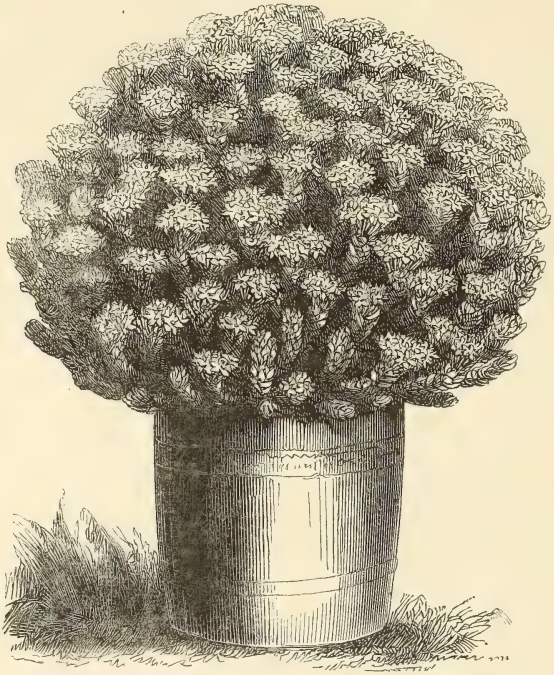
We now come to the plants in their third season of growth, and supposing that they are in a good state and well rooted, they must be removed into 15-inch pots about the middle of March, using the before-mentioned compost, and that in a tolerably rough state. The plants which did not bloom in the second year were stopped for the third time in February, but those which bloomed would not require stopping at that time, therefore one plant will bloom partially but the other will not. Now it is possible that the blooming plants will not require so large a shift as the growing one, but of that the cultivator must form the best opinion. Plants of Kalosanthes do not generally require large pots, as they will grow to a large size in comparatively small ones; but from the great weight of the plants, large pots are obliged to be used to keep them steady. During this season the same summer treatment must be pursued; but as the plants when freely growing do not like to be deluged with water by heavy rain, care must be taken to protect them in continuous wet weather. We generally place our plants in a spare pit or temporary house, where with a free circulation of air at all times, they can be protected from rain without much trouble.

The annexed vignette represents a plant of *Kalosanthes coccinea* in the third year of its growth, and the second of its blooming. It was grown in the garden of James Cook, Esq., Brooklands, Blackheath Park, where our drawing was taken. It was exhibited both in 1846 and 1847, by Mr. Ayres, both at the Horticultural Society's Garden, Chiswick, and also at the Regent's Park. The plant is still in splendid condition, and promises to be finer this season than ever.

Now the only secret in growing the Kalosanthes, or rather in blooming them, is to get the plants properly matured in the autumn, and the bloom set; and to effect this, it is necessary that the growth receive a timely check in the autumn, by reducing the supply of water, and by placing the plants in a dry sunny situation, such as the foot of a south wall, or close to the back wall of a cold pit, where they will be benefited by full exposure and considerable dry heat. It is, however, useless to think of blooming the plants, unless the growth is strong; therefore it is not advisable to stop a plant intended to bloom, later than the end of June, as after that time they rarely make growth sufficiently strong to produce good bloom.

When the plants are housed for the winter, they must be placed in an airy part of the greenhouse, and be kept close to the glass. Keep them during that time tolerably dry, and in the spring do all you can to prevent the extension of the blooming shoots until late in March, as, if the flower-stems get long, they look unsightly and require a great deal of staking. To bring the blooms out, of a really fine colour, they require to be placed in the full sun, and close to the glass, but care must be taken that the flowers do not get scorched.

The finest kinds of Kalosanthes at present in cultivation are *K. coccinea; coccinea* *major*, and a variety of Messrs. Henderson's, with very dark flowers, *K. versicolor*, *nitida* or *grandiflora miniata*, a very sweet-scented one, *K. jasmanoides*, a small early blooming white one, and *K. odoratissima*, a comparatively worthless flower, but admired by some for its fragrance.



Height of Plant	3ft. 9 in.	Height of Pot	1ft. 6 in.
Width of ditto	4 0	Width of ditto	1 6

THE BALM OR BALSAM OF GILEAD OF THE ANCIENTS.

THE Balm or Balsam of Gilead, so celebrated in past ages, and spoken so highly of by Strabo, Pliny, Diodorus Siculus, and other ancient writers, is a vegetable gummy substance, which, when first gathered from the tree, is turbid and white, with a strong pungent smell, and a bitter, acrid, astringent taste. After being kept for a time, it becomes more thin, limpid, and transparent, assuming a greenish colour, and afterwards a golden yellow, being then about the consistence of honey, and possessing a fragrant, resinous, and balsamic odour; in this state it is very tenacious, and will admit of being drawn out into long threads. It is then called *Opobalsam*, but in this pure state is rarely or never to be purchased.

Its medicinal properties were so highly extolled by the ancient physicians that it was by them considered a specific for almost every disease. Administered in doses of about three grains, it was said to strengthen weak stomachs; was deemed an excellent remedy for ulcers, and every description of wounds; being sudorific, was used in rheumatism; as an aromatic and stimulant, it was administered in all nervous and pulmonic complaints; and was esteemed as an antidote to the bites of poisonous reptiles. In Egypt, at this day, it is valued as a medicine of no ordinary character.

In Turkey, the ladies use it as an odoriferous ointment, and also as a cosmetic. Lady Mary Montagu mentions the extensive adulterations which this valuable drug undergoes, and states that, even in Constantinople, it is very difficult to obtain it in a pure state. Whilst resident in that city "she applied some to her face, which in consequence became swelled and inflamed, and continued so during three days; but on this subsiding, her complexion was much improved by the operation, and to this is attributed the fine bloom for which the Eastern ladies are so celebrated."

Notwithstanding the celebrity of this gum both in ancient and modern days, neither the Arabian physicians nor early writers appear to have been well acquainted with the origin of the plants from which it was obtained. The article was supposed by many to be solely a product of Judea, and as from the neighbourhood of Gilead in that country, the merchants chiefly brought their supplies into Egypt, it obtained the name of Balm or Balsam of Gilead.

From sacred history we learn that a little more than 600 years after the flood, or about 1730 years before the Christian era, the Ishmaelites and Arabian merchants, trafficking with spices and various Indian commodities to Egypt, carried this article also along with them.

Amongst the ancients, Theophrastus and Dioscorides called the plant *Balsamum*, or Balsam Tree. It is by them stated to be a native of Abyssinia, and this testimony has in modern times been confirmed by Bruce, who, in his "Travels," states that "it grows plentifully amongst the Myrrh trees behind Azab, all along the coast to the Straits of Babelmandel."

Niebuhr, in his book of travels, also asserts the same. Strabo mentions the locality of the plant particularly, and is probably the only one of the ancients who has done so. His words are, "Near to this is the most happy land of the Sabæans, where grows the Myrrh, Frankincense, and Cinnamon; and on the coast about SABA the *Balsam* also is plentiful." Other writers state it to be found growing plentifully about a day's journey from the Red Sea on the Asiatic side. Gerlach relates that the tree grows near Bederhunim, a village between Mecca and Medina, in a sandy rocky soil, confined to a track about a mile in length. From this locality it no doubt received the name of Balsam of Mecca. It is also called Beshan, or as Bruce terms it, Balessan.

Wherever the plant is originally a native, it seems to have been transplanted at an early age into the south of Arabia Felix; and, from the above accounts, we might judge that one of the first plantations which succeeded, was at Petra, the ancient metropolis of Arabia, now only a village, and called Beden or Bederthunein. Afterwards it was conveyed into Palestine, where its gum received the name of Balsamum

Judiacum and Balm of Gilead, and became an important article of the commerce of that country. This transplantation, according to Josephus, took place 1700 years before the Christian era, when the Queen of Sheba, Saba, or Azab, visited King Solomon; amongst other valuable presents, he relates that she gave him living plants of what was afterwards called the Balm of Gilead.

The name of the plant, as given by botanists, is BALSAMODENDRON GILEADENSIS; the *Amyris Gileadensis* of Linn. and Vahl., *Amyris Opobalsamum* of Forsk, and *Syriacum de Mecca* of some other authors. Bruce, in his description of it, says that it grows five or six feet high, branching much, with the aspect of a standard cherry-tree, red branches and white flowers. Its true characters, however, are as follows:—

BALSAMODENDRON GILEADENSIS.—An evergreen tree-like *shrub*, growing fourteen feet or more high. *Branches* numerous, crooked, and spreading. *Wood* soft, whitish, light, and covered with a smooth, reddish ash-coloured bark. *Leaves* thinly scattered, palmately trifoliate, sometimes with pairs of opposite pinnæ, and an odd one; *leaflets* nearly ovate, blunt, entire, and of a bright green. *Flowers* scattered upon the branches, small, white, unisexual. *Pedicels* axillary, one-flowered, and usually growing in threes, shorter than the petioles. *Calyx* persistent, divided into four small, acuminated teeth. *Petals* four, oblong, acute, concave, spreading, induplicately valvate in æstivation. *Stamens* eight, inserted under the annular disk, with elevated warts between them. *Filaments* tapering, erect, and terminated by oblong anthers. *Ovary* one, ovate, superior, two-celled. *Style* thick, the length of the filaments, and terminated by a quadrangular stigma. *Drupe* roundish-ovate, with an acute termination, opening by four valves, two-celled, or, by abortion, one-celled. *Cells* one-seeded. *Seed* a smooth nut.

The finest balsam is obtained from these trees by wounding the branches during the months of July, August, and September, whilst the sap is in most vigorous circulation; the gum that oozes is received into small earthen bottles, and every day's produce is poured into a larger vessel, which is kept closely corked. This is called *Opobalsam,* and can be obtained only by presents; the supply scarcely exceeds what is required in the seraglios, and for the use of the great officers; so that it is never sent out of the country. In this pure state, it will dissolve readily in water; whilst the coarser kind, and that which is adulterated with Cypress turpentine and oil of sesamum, remains undissolved on the surface.

The next kind is obtained by gently boiling the ripe fruit in water, and skimming off the balsamic matter as it rises to the surface. This is called *Carpo-balsam.*

The third, or most inferior kind, is obtained from the same materials which produced the Carpo-balsam, with an addition of young branches, and by increasing the fire, a supply of thick dark-coloured balsam rises, and is collected; this is called *Xylo-balsam.* These two last kinds are what chiefly reach Europe.

The wood is burnt as a perfume, in most parts of Arabia.

In cultivation, the plant requires the heat of a moderate stove, should be planted in a mixture of peat, loam, and sand, and may be easily increased by cuttings planted in pots of sand, and placed under a hand-glass in heat.

FLORICULTURAL NOTICES.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Burlingtonia rigida. This remarkable species is in flower in the Gardens of the Horticultural Society, Chiswick. It is well known from its very singular habit, and remarkable for the large and delicate violet blossoms so beautifully reticulated. A delicious odour is also another of its attractions.

Daphne Fortuni. We may again notice this very useful plant as being in good flower in the Gardens of the Horticultural Society, particularly as it yields a large amount of bloom at this season in a slight degree of heat. Its profusion of delicate lilac blossoms will always make it a great favourite, especially as it proves quite hardy.

Epidendrum aurantiacum. In the above-named Gardens this species is flowering abundantly, and very rarely to be met with in so fine a condition. It is now well known by its rich orange flowers produced in dense clusters above the dark-green foliage. As seen in the perfection of this specimen there is scarcely another of its species so striking in appearance. It was introduced by Mr. Hartweg to the Gardens of the Society.

Erica aristata. In the nursery of Messrs. Fairbairn, Clapham Rise, we saw a splendid specimen in perfection of this the finest of the Heath tribe. The plant was about two feet high, and rather more in diameter, completely covered with blossoms. In specimens of this kind of Heath, we should think a less number of supports would make the plant less formal and be more attractive, than when they appear like a round ball, as in this otherwise splendid specimen.

Lœlia flava. Mr. Blandy, of Reading, forwarded for exhibition to the rooms of the Horticultural Society, Regent Street, a very well-flowered specimen of the above. It has very bright yellow blossoms, produced at the top of an erect stem in a close mass. It is very pretty and lively in colour, not by any means a difficult species to cultivate, and worthy a place in every collection.

Miltonia cuneata. This species was forwarded by the above-named gentleman, in good condition, for exhibition in Regent Street. It is not a very showy species, having sepals and petals narrow and short, spotted with very dark-brown on a pale-greenish ground. The labellum is a creamy-white colour. The flowers are produced rather scantily on a scape more than three feet in length.

Odontoglossum pulchellum. A well-grown and profusely-flowered specimen of the above was forwarded to the Rooms of the Horticultural Society, Regent Street, for exhibition, by Mr. Warner. This species is easily cultivated, producing bloom very freely, rivalling the Lily of the Valley in the purity of its white flower and delicious fragrance. It ought to be in every collection, as it is almost always in flower.

Phaius, spe. nov. An introduction from Java by the collector of Messrs. Veitch and Sons, Exeter, not very showy, as in the present specimen it has but three flowers upon an upright stem about a foot long. The sepals and petals are brownish, very pale, the lip white, yellowish in the tubular part ; under the throat a broad blotch of pale lilac is seen. The foliage is broad, and about eighteen inches long.

Siphocampylus macrostoma. Messrs. Veitch and Son sent with the above to the Horticultural Rooms, Regent Street, a splendid specimen of the dark variety of *S. macrostoma ;* the variety consists in the leaves being stained with crimson underneath, and the flowers assume a deeper colour. The specimen was about four feet high, with several stems and branches terminating in large and compact masses of intense crimson-scarlet flowers. The plant had evidently been drawn up considerably in heat, but even with this disadvantage, it is a most useful plant for winter cultivation, lasting a long time in bloom. Messrs. Veitch received it from the Royal Gardens at Kew as a seedling species, and one of Purdie's introducing there. We likewise saw a very nice specimen about two feet high, in good flower, in the nursery of Messrs. Rollissons, Tooting, where we found

Siphocampylus, spe. nov., showing bloom ; and from the beauty of its colour we augur very favourably for its becoming a favourite with cultivators. The flower is large, about two inches and a half long, a rich rose-colour, with a lilac bloom, making it both rich and delicate. The flowers are produced singly, or in pairs at the axils of the leaves, and at the ends of the shoots. The foliage is woolly, undulated and serrated at the edges, and when fully grown, is richly marked with purplish veins, similar to the leaves of *Gesnera Zebrina.* We also noticed in their collection a very fine

VANDA, SPE. NOV., introduced by them from Java. It is in form and colour of the flower much akin to *Roxburghii* and *tessellata,* but more than double the size of either, being upwards of two inches in diameter. The sepals and petals are whitish, spotted all over with bright brown ; the lip is crimson-purple ; the back of the flower and peduncles quite white. The specimen had but one spike of bloom, holding five flowers, so that when a plant is of sufficient size to produce several spikes, we do not think it will be surpassed by any of its compeers. It is generally thought to be the same that the Dutch botanists have named *insignis,* but we believe it will not prove to be that species, but one equally handsome.

VRIESA PSITTACINA. Some little time since, this species was exhibiting its richly-coloured crimson flower-stem and bracts encircling the flowers, which were yellow and bright purple. It belongs to the pine-apple tribe, not a large-grower, flowers freely, and has an additional attraction over most of its race, by the flowers lasting a considerable time in perfection.

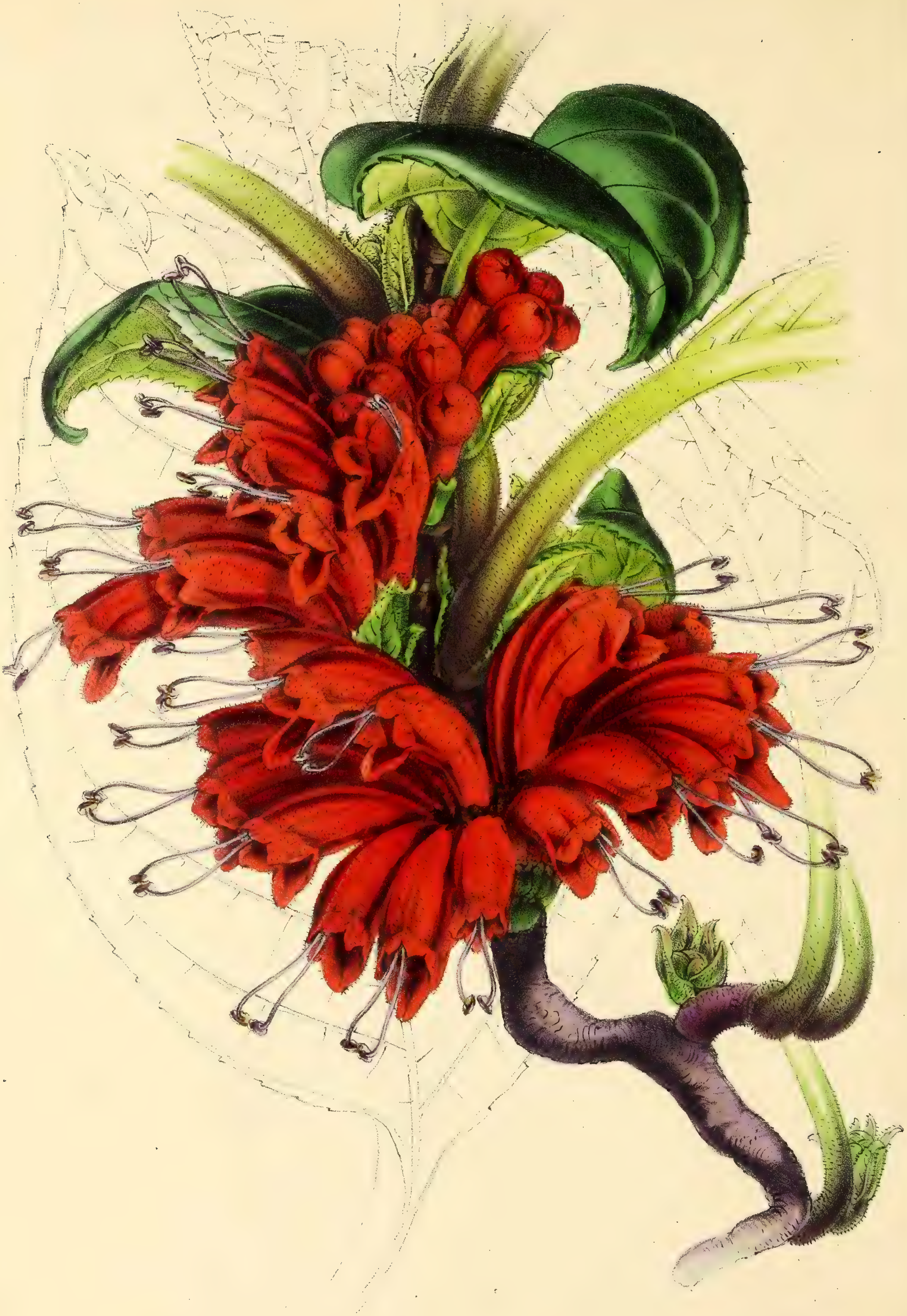
OPERATIONS FOR APRIL.

IN the stove, an increase of heat and moisture should be supplied as the season advances. Liberal potting, good drainage, suitable soil, and thin, clear, liquid manure once or twice a week, are amongst the best adjuncts to give vigorous and rapid growth. To render plants bushy, and of a good form, induce the production of lateral shoots by regularly stopping the ends of the others, when they have advanced a few joints. Now is the chief time to increase the stock by cuttings ; amongst other things, do not forget the finer species of *Thunbergia, Euphorbia,* especially *jacquiniflora, Begonia, Clerodendron, Pleroma, Ruellia,* and *Æschinanthus.* In the Orchid-house, heat, shade, cleanliness, and abundance of atmospheric moisture, together with a little fresh air, are the requisites of the present month. Admit air always in the mornings, and be careful that no plants are exposed to any direct draught ; close up very early in the day, and do not give too much fire-heat. Those plants on naked blocks, without moss, must at this season be particularly attended to ; otherwise, from their full exposure, they are very liable to suffer from too much light and drought. *Dendrobiums* making their growth will require a good supply of water. There will now be a pretty general growth ; and the plants, with a few exceptions, should be freely syringed. *Stanhopeas* will soon begin to protrude their flowers ; be careful that these be not damaged.

In the conservatory, allow no plants to suffer from drought. Administer thin liquid manure two or three times a week ; this is especially advantageous to orange trees. Attend to climbers with water, training, and stopping. *Camellias* which were removed successively into an increased heat, will, by the end of the month, have perfected their shoots ; they then scarcely require so much water at the roots, but shade and syringing must be continued the same as last month, until the flower-buds are formed ; then resort to a supply of liquid manure.

In the greenhouse, *Epacrises, Heaths, Corrœas, Chorozemas,* and other plants of similar habits, should have their leading shoots stopped to render them bushy. Give liberal shifts to such as require it, especially for specimen plants. Propagation should now progress as quickly as the shoots become in a fit condition for cuttings.

Frames and pits containing young potted-off plants, for turning out into the flower-garden, will merely require to be kept clean, to have plenty of air in fine weather, and to be supplied regularly with water. In the open air, dress beds and borders, prepare situations for planting out large specimens from the greenhouse. Sow annuals for late flowering, arrange herbaceous plants, and get everything in good order as soon as possible.



S. Holden. del & Lith

Agalmyla staminea

AGALMÝLA STAMÍNEA.

(Long-Stamened Agalmyla.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.
(Gesnerworts, *Veg. King.*)

Generic Character.—*Calyx* five-parted, equal. *Corolla* tubular, incurved, with a dilated throat, and an oblique, five-lobed, sub-labiate limb. *Stamens* five, exserted, of which two or four are fertile; anthers linear, connected, with parallel cells. *Stigma* bil-amellate. *Capsule* very long, silique-formed, two-valved, falsely four-celled. *Seeds* minute, ending in a hair at both ends.—*Don.*

Specific Character.—*Plant* an epiphyte. *Stems* creeping, robust, rooting at the joints, hairy. *Leaves* alternate, oblong, acuminated, denticulated, nearly equal at the base, fleshy, bright glossy green on the upper side, downy beneath and on the edges, about six inches long and four broad. *Petiole* three inches long, fleshy. *Flowers* diandrous, produced in dense fascicles at the axils of the leaves; each fascicle containing about fifteen flowers. *Calyx* tubular, smooth, green. *Corolla-tube* two inches long, of the brightest scarlet; throat wide, clothed with hairs; limb imperfectly two-lipped; upper lip two-lobed, lower three-lobed. *Stamens* exserted; filaments extending an inch beyond the tube of the corolla, of a bright purple. *Style* shorter than the stamens. *Stigma* divided at the termination into two broad thin plates.

Synonymes and Authorities.— Agalmyla *Blume, Bijdr.*, p. 766; Agalmyla staminea *Blume, Bijdr.*, p. 767; Cyrtandra staminea *Vahl., Enumer.* 1, p. 105; Justicia parasitica *Lam., Ill* 1, p. 42.

In December, 1847, Messrs. Veitch and Son, of Exeter, sent for exhibition to the Horticultural Society's Rooms, Regent Street, a fine specimen of this remarkably singular and handsome plant. The flowers resemble those of *Æschynanthus*, but the plant differs materially in habit.

It is a native of Java, whence it was lately introduced by the above gentlemen through their indefatigable collector, Mr. Thomas Lobb, who discovered it growing in humid parts of mountain woods.

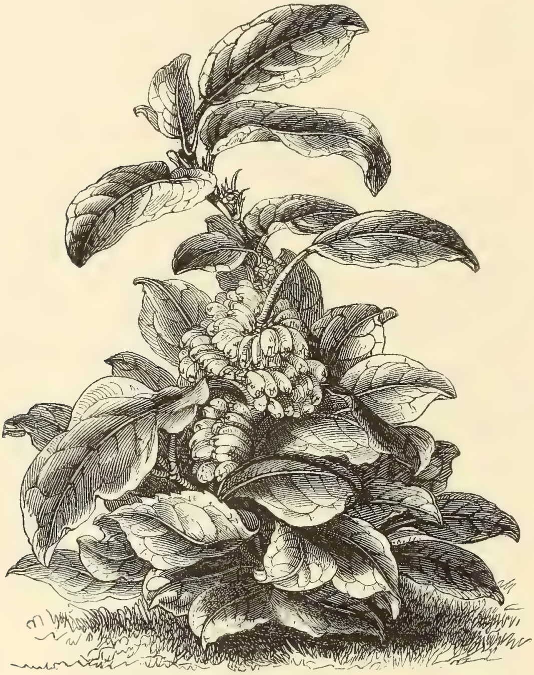
It is easily cultivated: the same treatment as is given to the various species of *Æschynanthus* suits it well; namely, the temperature of a warm and moist stove, with liberal watering and syringing during the period of growth; but in the season of rest to be kept nearly dry.

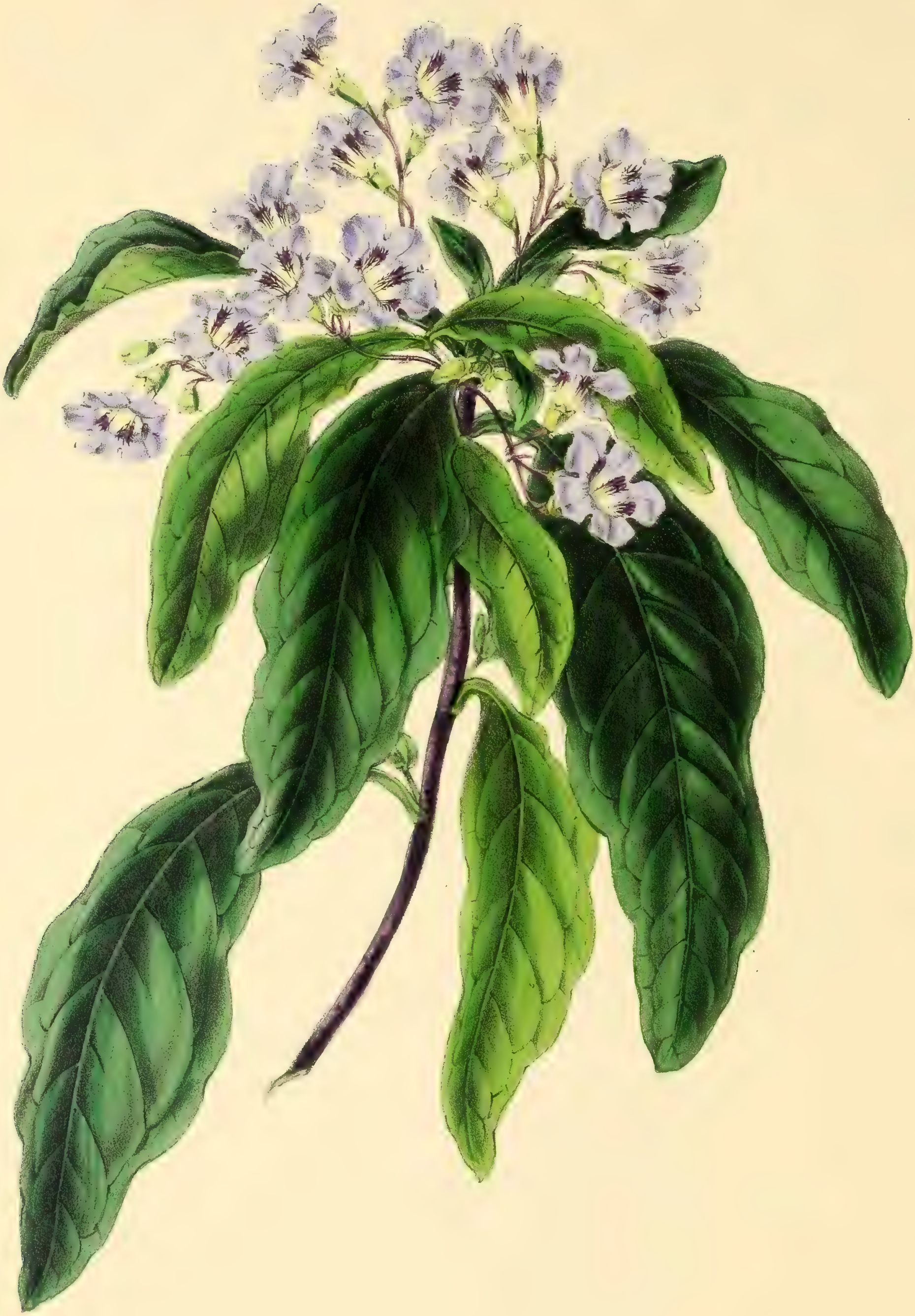
It should be potted in turfy peat, mixed with a portion of loam and sand, or vegetable mould. Good drainage is essential, both in the bottom of the pot, and also mixed through the soil.

Increase is effected by cuttings planted in pots of sand, and placed under a glass in heat.

Our drawing was made from a specimen communicated by Messrs. Veitch and Son, in December, 1847.

The generic name is derived from *agalma*, an ornament, and *hule*, a forest; because the species are great ornaments to the woods in which they grow.





S. Holden, del & Lith

Casselia integrifolia.

CASSÈLIA INTEGRIFÒLIA.

(Entire-leaved Casselia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
VERBENÀCEÆ.

GENERIC CHARACTER.—*Calyx* inferior, persistent, tubular, five-cleft or five-toothed. *Corolla* hypogynous, monopetalous, tubular, deciduous, with an irregular five-lobed limb. *Æstivation* imbricated. *Stamens* four, unequal. *Ovary* superior, two-celled. *Ovules* few. *Style* one. *Stigma* capitate and undivided. *Fruit* a berry.

SPECIFIC CHARACTER.—*Plant* an evergreen shrub. *Branches* numerous, smooth, round. *Leaves* alternate, without stipules, simple, entire, ovate-lanceolate, obtuse, waved, petiolate, smooth, glossy green on both surfaces. *Flowers* produced in loose racemes, of from four to six on each, proceeding from the axils of the leaves near the extremities of the branches. *Calyx* tubular, somewhat campanulate, five-toothed, teeth acuminated. *Corolla* funnel-shaped, delicate purple-blue, throat large, paler than the limb, marked with deep purple pencillings, interior of the tube yellow; *limb* five-lobed, somewhat two-lipped; upper lip two-lobed, lower lip three-lobed, middle segment longest, the whole more or less reflexed. *Stamens* shorter than the tube of the corolla.

AUTHORITIES AND SYNONYMES.—Casselia integrifolia *Nees Von Esenb.*, and *Mart.*, also *Steudel's Nomenclator*, p. 303.

THIS beautiful stove shrub is a native of the woods of Brazil, whence it was introduced some years ago to the continent, but by whom we are unable to say. In 1843 it was brought to this country. Messrs. Rollisson and Son, nurserymen, Tooting, received plants of it from M. Neumann, of Paris, which flowered in April, 1844, when our drawing was made.

In cultivation it is a hardy stove plant, requiring a moderate temperature not much exceeding a warm greenhouse.

It should be potted in a mixture of peat, loam, and sand, with good drainage, and plenty of room for the roots to run.

Increase is easily effected by cuttings planted in sand or soil, and placed in a moderate but moist heat.

(NEW ORCHID.)

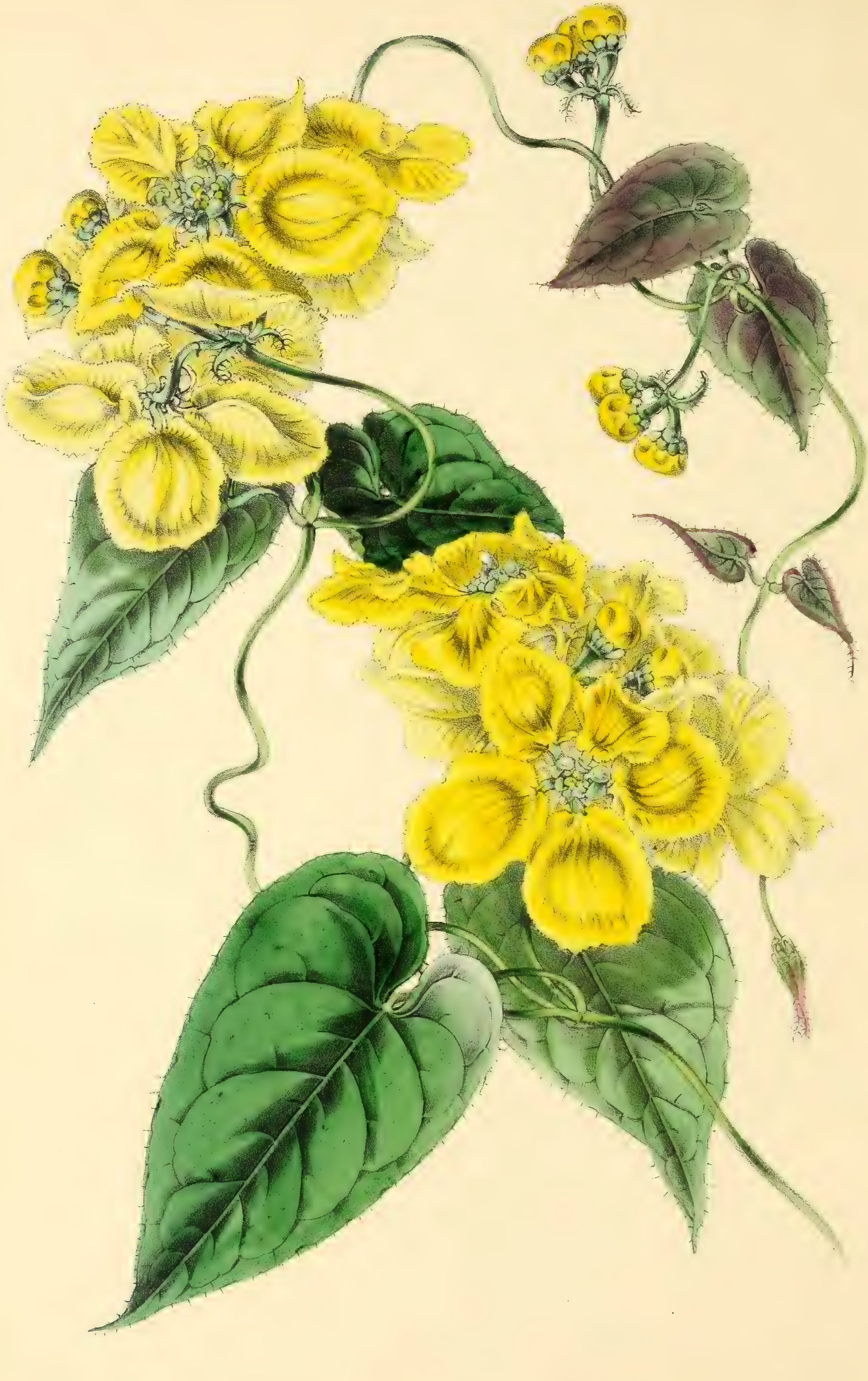
CORYANTHES FIELDINGII *Lindl.*

Description.—The *flowers* are pendulous and inverted, so that the apparatus of the column hangs downwards instead of being erect. The general colour of the parts is pale brownish-yellow, a little mottled, and stained with cinnamon in an irregular manner. When closed the flower is about five inches long, and three wide. As it unfolds, the sepals and petals, which are membranous and bear no small resemblance to a bat's wings, turn back, seem to fold up, and finally hang drooping at the back of the lip and column, in which organs, as is well known, the singularity of the genus resides.

The lip is borne by a thick horizontal arm an inch and a half long, which proceeds from the top of the flower-stalk, and consequently from the lower end of the column. Right and left of its base are placed two softish fleshy pale ear-like lobes, which are the organs of secretion, a sweet fluid continually dripping from them as long as the flower is in vigour.

At the other end this horizontal arm expands into a convex cap or hood, hairy in front, but bald on the crown; a little compressed from the back, and two inches across in its principal diameter. From the cap hangs down a large fleshy goblet, smooth at the edges, flattened at the end, two inches deep, and as many wide, and connected with the cap by a hollowed fleshy stalk, which is strongly marked by various transverse fleshy folds, warts, and ridges; into this goblet drips the honey, secreted by the two ears at the base of the horizontal arm which carries the lip. On the side next the column the goblet is opened, and near the bottom of this opening it is furnished with three sharp-pointed lobes, of which the lateral curve downwards, and the middle one stands erect, rising just high enough to come in contact with the head of the column, which grows downwards so far as almost to touch it.

The column is a large fleshy club-shaped body two inches and a half long, and throwing back its head, till its bosom becomes so round and large as to be comparable to the breast of a puffer pigeon. The head of the column divides into two short, flat, fleshy, curved arms, between which the anther is seated.—*Lindl. in Journ. Hort. Soc.*



S Holden, del & Lith.

Stigmaphyllum ciliatum.

STIGMAPHÝLLON CILIÀTUM.

(Ciliated-leaved Stigmaphyllon.)

Class.
MONADELPHIA.

Order.
DECANDRIA.

Natural Order.
MALPIGHIÀCEÆ.

Generic Character.—*Calyx* five-parted, each segment furnished with two glands at its base. *Petals* five, unequal, unguiculate. *Stamens* ten, unequal and dissimilar. *Anthers* thick, and resembling glands. *Styles* three, distinct, the extremities spreading out like a leaf. *Carpels* three, indehiscent, one-seeded, ending in a simple membranous wing.

Specific Character.—*Plant* a twining evergreen shrub. *Leaves* opposite, cordate, oblique at the base, smooth, ciliated, glaucous. *Petioles* with two glands at the top. *Flowers* large, umbellate, three to six in an umbel. *Calyx* glaucous green; *lobes* fleshy, nearly orbicular; *glands* small. *Corolla* of five broad, fringed, and rounded petals, of a rich orange-yellow; *claws* long. *Stamens* with the filaments, awl-shaped.

Authorities and Synonymes.—Stigmaphyllon *Auguste de St. Hilaire, Lindley* in *Bot. Register,* 1659; S. ciliatum *Lindley* in *Bot. Reg., v. 27,* 154 *descrip.*; Banisteria ciliata *Lamarck Dict.*, 1, p. 369, *G. Don* in *Syst. of Gard. and Bot.*, 1, 644.

The genus *Stigmaphyllon* was formerly associated with *Banisteria*, and contains some very handsome species, all climbers, but many are yet unknown in British collections. They are natives of Brazil, where in the woods and thickets they grow abundantly, and are certainly deserving the attention of collectors.

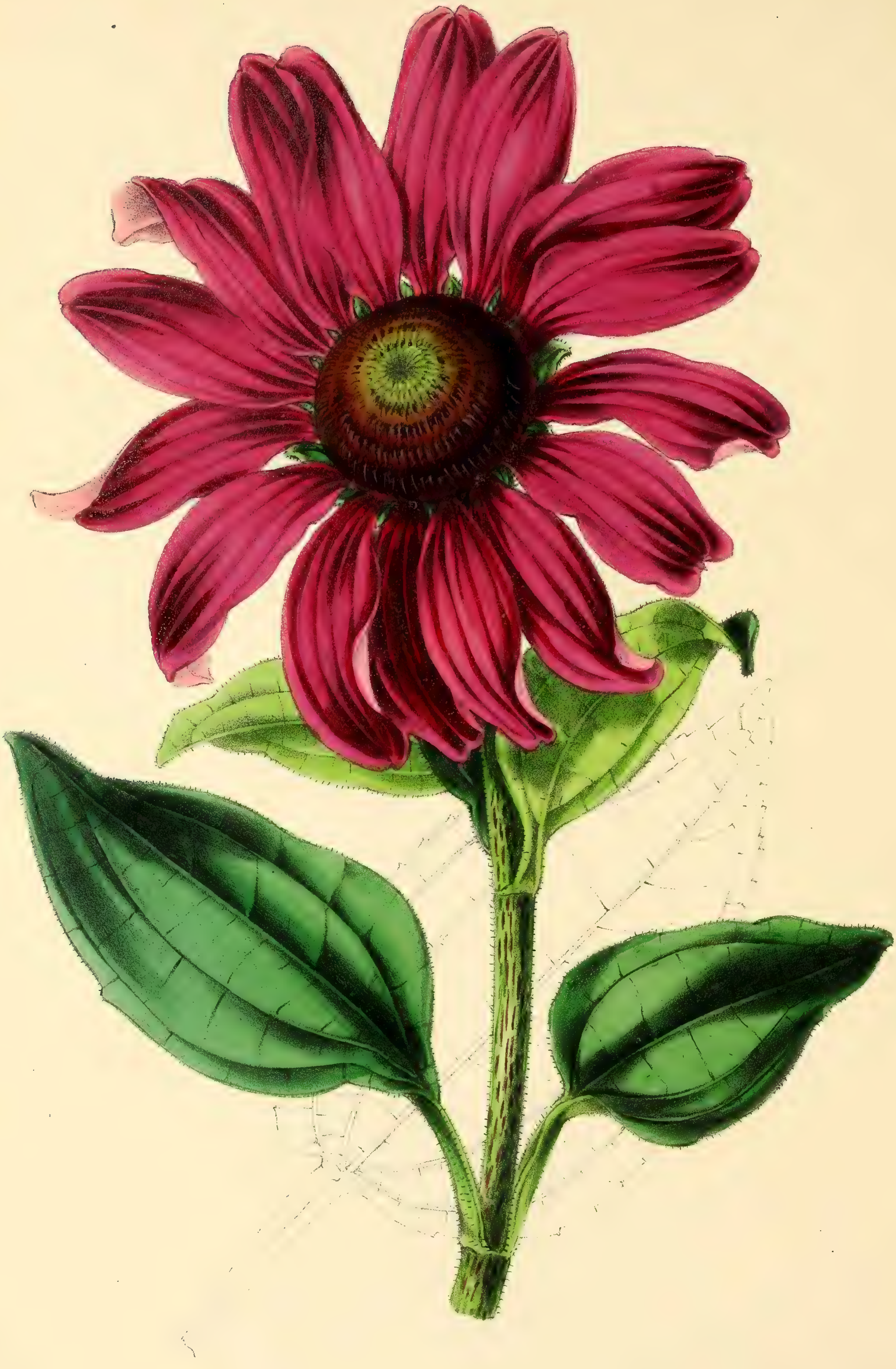
Our present subject was introduced in 1840, and flowered for the first time at Sion House in 1841, in the splendid collection of the late Duke of Northumberland. It has since bloomed with several other cultivators, and our drawing was made from a fine specimen in the possession of Messrs. Knight and Perry, nurserymen, King's Road, Chelsea, in October, 1846.

It is a handsome stove plant; the leaves have a fine texture, with a glaucous and shining surface; the flowers are large, produced in axillary umbels, and are of a very bright yellow.

It grows freely in a light turfy loam, or in a mixture of loam, peat, and sand; and cuttings taken from the ripened wood will strike root if planted in sand under a hand-glass in heat.

The generic name is derived from *stigma*, a stigma, and *phyllon*, a leaf; because the termination of the style becomes expanded into the form of a leaf.

Malpighiaceæ as at present arranged consists of forty-three genera; many form handsome trees, others are climbers; their flowers are generally showy, the foliage neat, the wood tinged with red, and the bark bitter. Some bear eatable fruit, and *Malpighia urens* and *glabra* are cultivated for that purpose in the West Indies and South America under the name of Barbadoes Cherries. In appearance and size the drupes of the latter species greatly resemble our May Duke Cherries; but (although juicy and sweet) they are in every respect inferior. The fruit of *M. urens* may be likened to the common wild cherries of our plantations.



S. Holden del & Lith.

Echinacea intermedia.

ECHINÀCEA INTERMÈDIA.

(Intermediate Hedgehog-flower.)

Class.
SYNGENESIA.

Order.
POLYGAMIA.

Natural Order.
ASTERÀCEÆ.
(Composites, *Veg. King.*)

Generic Character.—*Capitulum* many-flowered, heterogamous. *Florets* of the ray neutral, each with a long strap-shaped limb, arranged in a single row. Florets of the disk hermaphrodite, regularly quinquefid. *Tube* short. *Orifice* naked. *Limb* toothed, erect. *Involucrum* arranged in three series; scales lanceolate, ciliated. *Receptacle* ovate. *Palea* rigid, projecting beyond the florets of the disk, very numerous. *Stamens* scarcely longer than the corolla. *Style* longer than the stamens, and separating at the extremity into two semi-lanceolate branches. *Achænia* four-sided, somewhat pyramidal, downy.

Specific Character—*Plant* a herbaceous perennial, growing two feet high, with a robust habit. *Stem* clothed with short bristle-like hairs, and streaked with dull brown. *Leaves* scabrous, dark-green, nearly heart-shaped at the base, verging, towards the upper part, to ovate-acuminate; primary opposite, but assuming an apposite position on the lateral floral branches. *Flowers* showy, four or five inches diameter, bright reddish-purple or lilac. *Involucrum* green, tinged with brown. *Florets* of the ray large and spreading. *Disk* elevated.

Authorities and Synonymes.—Echinacea *Mœnch. Meth.*, 591, *De Candolle, Prod.* 5, 554; Rudbeckia *Linn.*; E. intermedia *Lindl.*

The blooming season of this fine new herbaceous plant is from the end of July until the beginning of November, and it is one of our finest autumnal border plants.

We made our drawing from a specimen sent us by Messrs. Backhouse and Son, of the Fishergate Nurseries, York, in August last, with whom it continued long in bloom, and was deservedly admired.

Like all the other species of *Echinacea*, it is, we presume, a native of the cooler parts of Mexico, and of recent introduction, but when, and by whom, brought to this country is uncertain. It is pretty liberally distributed both amongst nurserymen and in private collections. Being perfectly hardy, a free bloomer, very handsome, and of the easiest management, it will no doubt be as universally cultivated as its merits deserve.

In habit it approaches the nearest to *Echinacea speciosa* (*Rudbeckia speciosa*

De Candolle), but is very distinct from it, and a much finer species. It will grow in any common garden soil, and may be increased by division of the roots.

The generic name is derived from *echinus*, a hedgehog, from the prickly scales of the receptacle giving that appearance.

BOTANY AS A SCIENCE.

We propose to take a somewhat enlarged view of this subject as regards its usefulness and moral agency, but not by any means to enter upon the question of Systems. Botany, generally, does not appear to extend. Gardeners and practical men have little time which they can devote to abstruse subjects. Among amateurs there are few who *can* study affinities, and some persons openly declare that they consider the attempt as morally objectionable. Tastes and mental temperaments differ; indolence is also prevalent, and where that is the case, the *Cui bono?* is ever the appeal. The difficulties which meet the student of the so-called Natural System are much to be lamented; but the truth is, we really *know* very little, and are only making approaches; hence it is, that the science is confined to a few learned professors, and to those persons who are led on by genius to the pursuit of an object, in the attainment of which they are qualified to excel.

The taste for Physiological Botany is a natural gift; and this being admitted, we will endeavour, by reference to some worthy authorities, to repel the objections of those who dogmatically endeavour to mar the pleasure of others, by assuming the character of judges.

The following is extracted entire and *verbatim* from the first edition of the "Natural History of Selborne," by the late Reverend and estimable Gilbert White, Letter XL., dated June 2, 1773, to the Hon. Daines Barrington:—

"The standing objection to Botany has always been, that it is a pursuit that amuses the fancy and exercises the memory, without improving the mind or advancing any real knowledge; and, where the science is carried no further than a mere systematic classification, the charge is but too true. But the botanist that is desirous of wiping off this aspersion, should be by no means content with a list of names; he should study plants philosophically, should investigate the laws of vegetation, should examine the powers and virtues of efficacious herbs, should promote their cultivation, and graft the gardener, the planter, and the husbandman, on the phytologist. Not that system is by any means to be thrown aside; without system the field of Nature would be a pathless wilderness; but system should be subservient to, not the main subject of pursuit. Vegetation is highly worthy of our attention; and in itself is of the utmost consequence to mankind, and productive of many of the greatest comforts and elegancies of life. To plants we owe timber, bread, beer, honey, wine, oil, linen, cotton, &c.; what not only strengthens our hearts and exhilarates our spirits, but what secures us from inclemencies of weather and adorns our persons. Man, in his true state of nature, seems to be subsisted by spontaneous vegetation; in middle climes, where grapes prevail, he mixes some animal food with the produce of the field and garden; and it is towards the polar extremes only that, like his kindred bears and wolves, he gorges himself with flesh alone, and is driven, to what hunger has never been known to compel the very beasts, to prey on his own species. The productions of vegetation have had a vast influence on the commerce of nations, and have been the great promoters of navigation, as may be seen in the articles of sugar, tea, tobacco, opium, ginseng, betel, paper, &c. As every climate has its peculiar produce, our natural wants bring on a mutual intercourse; so that by means of trade each distant part is supplied with the growth of every latitude. But without the knowledge of plants and their culture, we must have been content with our hips and haws, without enjoying the delicate fruits of India, and the salutiferous drugs of Peru."

The mere knowledge of names is simple—a faculty of memory; and so far Mr. White was correct in his first admission. But memory in the abstract is a noble gift—one which ought to be highly prized and cherished. It has, however, no reference to any science, and Botany is one of a very high order; for, to say the least of it, no one can study it, even in its simplest form—that of the Linnæan System—without having frequent recourse to the microscope—an instrument which, as the late Dr. Chalmers taught, is perhaps better calculated to reveal the wonders of creative power, than is the telescope, in as much as it brings to view the infinitesimal minutiæ of organisation. Say, then, that a botanist of the Linnæan school seeks only to assign any plant, new and strange to himself, its proper place in one of the classes, how, we ask, can he attain his object, but by dissecting the flower, and appealing to the microscope at every step? And what must be the result? Will not the positions of the calyx, corolla, stamina, and pistillum, with their multifarious appendages, exhibit the wisdom and beauty of *structure?* And this—to say nothing of the position of the seed-vessel, the attachment of the seeds to the placentas, and the evident vitality and vitalising powers of the farina—does it not appeal to the mind, and arouse a feeling of that high admiration, which Lord Bacon styled "the superlative of praise?" Surely they who can denounce the study of even Structural Botany, as a waste of time, a frivolous pursuit, are no friends to true piety.

The history of Botany is well calculated to demonstrate the importance of the science; and therefore the reader is requested to peruse, as a valuable compendium, the article "Botany," which commences at page 243, vol. v., of the "Penny Cyclopædia." In it the progressive advances of the science are ranged under six eras; the first of which commences at the period when Theophrastus succeeded to the chair of Aristotle, 324 years before Christ. He, it is said, was acquainted with not more than 355 plants. Paying little attention to the denomination of species, he appears, nevertheless, to have had some notion of the sexes of plants, as he alluded "to the necessity of bringing the male dates into contact with the females." By the time of Pliny the Naturalist, who flourished during the reign of the Emperor Vespasian, Botany had made some advances, for the sexes of plants were spoken of in positive terms; grafting and budding are also described, and the agency by which the union of the two members is effected, alluded to in terms sufficiently precise. Here, however, a blank occurs. Science made no advances; it gradually declined, and became all but extinct during the dark ages, that commenced with the decline of the Roman empire. How long this miserable blank continued, may be gathered from the fact, that about the middle of the fifteenth century, the names of Brunsfels, Fuchsius, and Matthiolus stand recorded, as being among the earliest reformers of Botany.

To such a degree did the discovery of species subsequently extend, that some mode of arrangement was sought for, and the first attempt to effect it is ascribed to Conrad Gesner, who died in the year 1665. "He appears to have brought about one most important change in science, by discovering that the distinctions and true nature of plants were to be sought in their organs of *reproduction*, rather than in those of nutrition." After Gesner, we find the names of Turner, Lobel, Clusius, Cæsalpinus, and the two Bauhins, all immortalised by plants, which are still in high estimation: they flourished between the years 1560, and 1600. At this period or second *era*, a systematical arrangement was attempted; and to Lobel, a Dutch physician residing in England, "the honour is to be ascribed of having been the first to strike out a method by which *plants could be so arranged, that those which are most alike should be placed next to each other, or which should express their natural relation.*" The third *era* saw the introduction of the microscope, an instrument to which we are mainly indebted for the examination of the internal tissues of plants, and in 1661, the spiral vessels were discovered. Henshaw, Hook, and the celebrated Grew and Malpighi flourished at this period. The names and honours of the two last stand recorded in the genera *Grewia* and *Malpighia*, the last being the type of the order *Malpighiaceæ.*

The fourth *era* is that of Ray, the author of "Historia Plantarum," in 1686. In this period we meet with the names of Magnol, (whence *Magnolia*), Tournefort, and Linnæus. The mention of the last great name, brings us to the—

Fifth, which may very properly be styled the LINNÆAN ERA. A few lines from the article on Botany, will tend to do justice to his fame. "Linnæus, educated in the severe school of adversity, accustomed from his earliest youth to estimate higher than all things verbal accuracy and a logical precision; endowed by nature with a most brilliant understanding, and capable, from constitutional strength, of any fatigue either of mind or body, this extraordinary man was destined to produce a revolution in Botany. No naturalist has ever been his superior, and he richly merited that high station in science, which he held for so many years. His verbal accuracy, together with the remarkable terseness of his technical language, reduced the crude matter that was stored up in the folios of his predecessors, into a form that was accessible to all men."

The history of this extraordinary man ought to be familiarly known to every lover of phytological science; therefore we earnestly recommend the perusal of a work called "Lachesis Lapponica; or A Tour to Lapland, from the original Manuscript Journal of the celebrated Linnæus, by the late Dr. James Edward Smith." It describes the early labours and observations of a very young philosopher, in language charmingly simple; it also abounds with incidents and anecdotes equally instructive and entertaining. The book opens thus:—"Having been appointed by the Royal Academy of Sciences to travel through Lapland for the purpose of investigating the three Kingdoms of Nature in that country, I prepared my wearing apparel, and other necessaries for the journey, May 12, 1732, Old Style. I set out alone from the city of Upsal, on Friday, May 12, 1732, at eleven o'clock, being at that time within half a day of 25 years of age. At this season, Nature wore her most cheerful and delightful aspect, and Flora celebrated her nuptials with Phœbus,

> Omnia vere vigent, et veris tempore florent,
> Et totus fervet Veneris dulcedine mundus."

Here is a specimen of the joyous spirit of a young and aspiring genius which was destined to become one of the most brilliant lights of science.

Whatever may be the end of his system, it has certainly proved a source of delight to thousands, and as such, must be cherished by all who have felt its utility. They who cannot grasp the mysteries of the Jussieuean, or so-called *Natural System* (the announcement of which introduced the sixth *era*,) and yet aspire to the knowledge of some method of classification, would do well to consult the "Introduction to Botany," by the late Dr. Smith, as re-edited by Sir W. J. Hooker. Therein, the merits of the two systems are faithfully compared and elucidated, and the enquiring may thus be enabled to satisfy his own mind which of them is best adapted to the object he has in view.

ON THE CULTIVATION OF THE LEE-CHEE, LONGAN, AND RAMBOOTAN, AS FRUIT TREES.

THE LEE-CHEE, La-tje, or Li-chi, of the Chinese, is the *Euphoria Litchi* of our botanical catalogues. Linnæus, in his "Genera Plantarum," 1425, called it Nephelium Litchi, and this name has been adopted by G. Don in his "System of Gardening and Botany," (i., p. 670.) Loureiroin his "Flora Cochin-China," (i., p. 233,) published in 1790, called it Dimocarpus Lychi; and Aiton, in the first edition of his "Hortus Kewensis," published 1789, called it (ii. p. 36,) Sapindus edulis.

In China, where it is extensively cultivated, the fruit is deservedly esteemed, being fully equal, if not superior to, any of the small fruits grown in the Chinese Empire. European botanists have long been acquainted with the plant, which was introduced into this country so far back as 1786; but it has never been much cultivated, nor to our knowledge has ever fruited in any of our stoves.

DESCRIPTION.—*Plant* a tree-like shrub fifteen to twenty feet high. *Branches* numerous, spreading. *Leaves* alternate, abruptly-pinnate, consisting of four pairs of pinnæ; smooth, shining, exstipulate; leaflets nearly opposite. *Flowers* small, produced in lose terminal panicles; slightly fragrant. *Bracts* minute, deciduous. *Calyx* five-parted, of a greenish-yellow tinged with red, covered on both sides with soft pubescence. *Corolla* wanting. *Disk* large, pubescent. *Stamens* eight, arising from the upper part of the disk. *Fruit* oblong, reticulated, red when ripe, acquiring the size of an Orleans plum; pulp transparent; stone large. It belongs to the Natural Order Sapindaceæ, and is a native both of China and various parts of the East Indies. During the residence of Mr. Gibson in India, whilst employed as a botanical collector for His Grace the Duke of Devonshire, he had frequent opportunities of testing the relative value of this fruit with other tropical productions; and he considers it very superior to any of the varieties of Mangosteen, and certainly not surpassed by any other tropical fruits he tasted. The netted rind is somewhat hard and dry, but separates easily from the pulp, which is colourless, transparent as jelly, and exceedingly sweet, but possesses also a portion of very pleasant acid. When ripe, the flavour is delicious; but the fruit are said to produce disease if eaten to excess. The Chinese allow them to dry until they become black like prunes; they are also used to sweeten tea, to which they communicate a pleasant taste, preferable to sugar. They are only received in this country in a dried state.

The trees are extensively cultivated both in the East Indies, the southern provinces of China, and northern parts of Cochin-China. Mr. Gibson states that the trees are grown in orchards, where they form broad spreading bushes, and ripen their fruit in the beginning of the hot season in May. He describes the pulp to be like that of a very fine grape with a peculiar vinous flavour, but quite destitute of anything like muskiness. Heavy crops are generally borne, consisting of ten or twelve full-grown fruit on each panicle.

The plant does not bear strong sunlight well. In the tropics, the Lee-Chee orchards are sheltered by lofty trees, the shadows of which protect the fruit trees from injury by the intensity of light.

The LONGAN, Lang-an, Long-yen, or Laong-uhan, of the Chinese, is another excellent fruit-bearing shrub; it is the *Euphoria Longana* of our botanical catalogues, the *Nephelium Longana* of Cambessédes in "Mem. Mus." (xviii., p. 30); and of G. Don's "System of Gard. and Bot.," (i., p. 670;) the *Dimocarpus Longan* of Loureiro, in "Flor. Cochin.," (p. 233,) and the *Scytalia Longan* of Roxburgh, in his "Hort. Beng.," (p. 29); and the *Nephelium Bengalense* of G. Don's "System of Gard. and Bot.," (i., p. 670), which last is only one of the many varieties, and not a distinct species.

DESCRIPTION.—*Plant* a tree twenty to thirty feet high. *Trunk* erect, branched, bark grey. *Leaves* scattered, abruptly pinnate; common petiole (nine inches long) swollen at the base, nearly round, slightly scabrous, pale brown, glaucous at its origin; *pinnæ* (four inches long, one and a-half broad) in five pairs, unequal at the base, coriaceous, pale-green, shining and glabrous above, paler and slightly scabrous below; *middle rib* and oblique parallel lateral *veins* prominent below, flat above, reticulation obscure. *Panicle* large, terminal; *rachis* and its branches covered with soft, short pubescence. *Bracts* minute, deciduous. *Flowers* perfumed, shortly pedicellate. *Calyx* five-partite, covered on both sides, as well as the pedicels, with pubescence similar to that on the rachis; *segments* ovate, concave, undulate. *Petals* five, about equal to the length of the calyx, spathulate, reflexed between the sepals, pubescent on both sides. *Disk* large, pubescent, flattened, lobed, covering the origin of the petals. *Stamens* eight, arising from the upper part of the disk near its centre, rather longer than the calyx; *filaments* subulate, spreading, slightly hairy; anthers ovato-oblong, attached by the back near the base; *lobes* slightly divaricated at the base; *pollen* abundant; *granules* minute. *Pistil* pubescent, shorter than the stamens, in many of the flowers abortive early; *germen* two to four-lobed, diverging. Every part of the flower is pale-yellow.—*Graham*, in *Bot. Mag.*, 4096.

This plant is cultivated extensively in China and Cochin-China, for the sake of its fruit, which is highly esteemed; but not equal to that of the Lee-Chee. It is said to be more wholesome, however, and is smaller in size and of a brown colour; the pulp is surrounded with a tough leathery coat; it is colourless, and semi-transparent; the centre is occupied by a dark-brown seed, which, in some of the varieties, is large, and in others small. The flavour of the pulp is sweet, subacid, and particularly pleasant to the taste, especially in a warm climate, but inferior to the Litchi. It has been ripened by John Knight, Esq., at Lee Castle, in a lofty stove, erected for the purpose of growing tropical fruits, and a bunch was presented by him to the Horticultural Society, in September 1816, supposed to be the first ever produced in Europe, and was considered by competent judges to be fully equal to any grown in the tropics. It was also fruited by Mr. Forrest in 1833, in the stove of His Grace the Duke of Northumberland, at Sion House; and in several other places it has flowered and set abundant crops, but, except at Lee Castle, none that we are aware of have been ripened.

The RAMBOOTAN, Rambutan, or Rampostan, is a native of the East Indies, and is the *Euphoria Nephelium* of "De Candolle's Prodromus," (i., p. 612); the *Scytalia Rambootan* of "Roxburgh's Hort. Beng.," (p. 29); *Dimocarpus crinita* of "Loureiro's Flor. Cochin.," (p. 234); and the *Nephelium lappaceum* of "Don's Syst.," (i. 670).

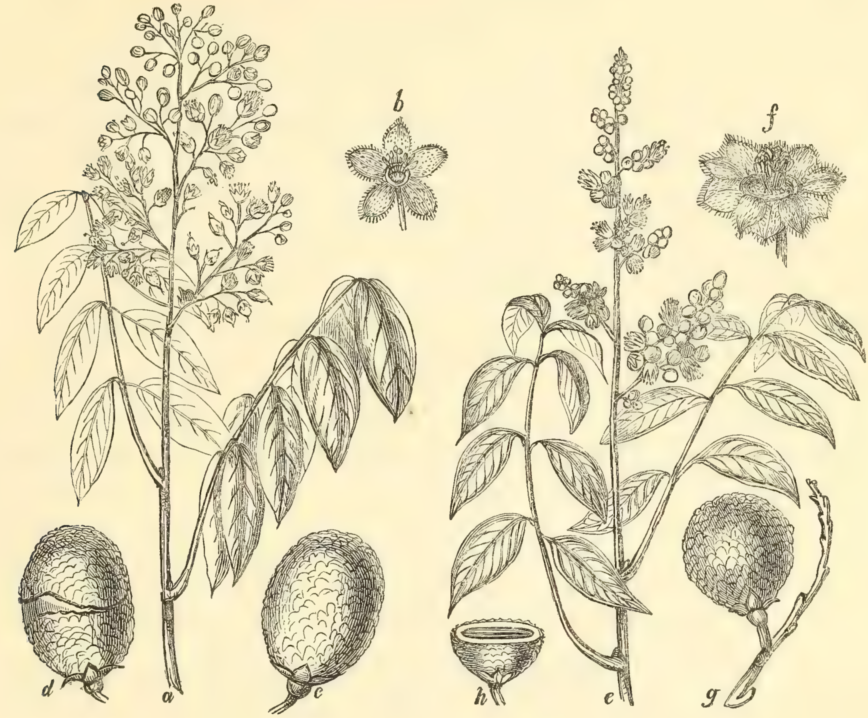
DESCRIPTION.—*Plant* a spreading tree. *Leaves* pinnate; leaflets five to seven, oblong. *Flowers* in terminal panicles. *Calyx* five or six-cleft. *Petals* absent. *Stamens* eight, or by abortion five. *Fruit* sub-ovate, hairy, about the size of the Longan, usually twin, with an agreeable sub-acid flavour, but inferior to the Lee-Chee and Longan. It is a species which deserves to be grown as a fruit tree, and would no doubt be much improved by cultivation.

Besides the above, there are also three other species which deserve to be mentioned, for although they are not equal in importance to the preceding ones, yet the fruit they produce are by no means to be despised. These are—

EUPHORIA VERTICILLATA.—Whorled-leaved Euphoria. This is the *Nephelium verticillatum* of "Don's Syst.," (i. 670), and the *Scytalia verticillata* of "Roxb. Hort. Beng.," (p. 29).

The plant forms a low spreading bush, scarcely exceeding six feet high. *Leaves* alternate, simple, obovate, lanceolate, very smooth, auricled at the base. *Flowers* in small terminal panicles, white, with a dash of reddish pink. *Sepals* unequal. *Stamens* eight, monadelphous at the base. *Ovary* surrounded by eight glands.

It is a native of the Moluccas, and in the Botanical Garden at Calcutta it flowers during the rainy season, that is, from June to October, and ripens its fruit in the hot season, from March to June.



DESCRIPTION OF THE WOOD-CUT.

a Branch of *Euphoria Litchi*, to show the pinnated leaves, and spreading panicle of inflorescence.
b A detached flower, exhibiting the five segments of the calyx.
c A detached fruit, one-fourth of the natural size.
d A fruit with the outer reticulated skin broken to show the transparent pulp.

e Branch of *Euphoria Longana*, showing the panicle of inflorescence.
f A detached flower.
g Fruit, one-fourth the natural size.
h Fruit cut open to show the stone in the centre.

Euphoria informis—" De Candolle's Prodromus," (i. 612.) The *Nephelium informe* of " Don's Syst.," (i. 670). It forms a tree about twenty feet high. *Leaves* pinnated; leaflets four to six pairs. *Flowers* produced in small terminal panicles. *Berries* usually twin, irregular, tubercular. It is a native of Cochin-China, where it grows in woods. The fruit is much eaten and esteemed, but it contains more acid than any of the preceding. The wood is also used for various purposes, being durable, hard, heavy, and of a reddish-brown colour.

Euphoria pinnata.—Pinnate-leaved Euphoria. The *Nephelium pinnatum* of

"Don's System," (i 670), and *Pomatia pinnata* of "Forst. Prod.," (p. 392). It is stated by Don to form a tree with pinnate leaves, supra-decompound, terminal racemes of flowers, and to be a native of the islands of Tanna and Namoka.

The cultivation of these plants is by no means difficult, but it is necessary to pay attention to the following particulars :—

The temperature required by the whole is that of a stove, where, during the season of growth, the plants can be liberally supplied with both heat and moisture; but when they are at rest a very moderate temperature can be allowed.

The soil, if the plants are grown in pots or tubs, should be a mixture of loam, peat, and very rotten dung; but if planted out into a prepared border, peat may be altogether dispensed with, and a little sand added to keep the soil open. In any case do not break the soil small, but allow it rather to be in turfy lumps.

Drainage is of the greatest importance; their roots will not endure the least stagnation of water. Throw plenty of crocks or other rubble into the bottom of each pot or tub, and also mix a portion throughout the soil.

Shade must likewise be considered one of the requisites for successful management, and yet the plants will not thrive if placed under the drip of other trees, or where they cannot enjoy the rays of the sun. Place them in such part of the house, that the rays may fall obliquely upon them during the hot part of the day.

Increase by cuttings of the ripened wood planted in pots of sand, and placed under a glass in a moderate moist heat.

THE FRANKINCENSE OF THE ANCIENTS.

This fragrant gum resin, which has for ages been held in high esteem in all Eastern nations, is known to us by the name of *Olibanum*. Our supplies are derived both from Turkey and the East Indies; and we receive it in the form of small pellucid drops or tears, of a pale-yellow colour, somewhat hard and brittle, of a slightly bitter and resinous taste, and of a peculiar aromatic smell. Sometimes it is imported in a mass, of a dull red colour, but this, being of an inferior quality, is probably the produce of other trees; so that the tears are always to be preferred.

Administered internally as medicine it is stimulant, astringent, and diaphoretic; it is, however, seldom used in Britain, except to fumigate sick chambers, in connexion with other aromatic gums and spices. It was one of the ingredients in the formation of the sweet incense used in the tabernacle and temple-worship of the Jews, and is still used for similar purposes in both the Greek and Roman churches, and also in the Indian and Mahomedan temples; although Gum Benzoin, on account of its cheapness, has in some places been substituted in its stead. Its value was formerly very great, and it formed one part of the present offered by the Magi who came to Bethlehem, to see the infant Messiah.

Notwithstanding the great use which has been made of this article in both religious worship and medicine, of the trees which produce it very little is known. It has generally been considered a production of Arabia Felix, and trees have been said to grow near the city of Sabe; hence it has been called by some writers Gum Sabæum. It is certain that until this last half-century, all the supplies were solely drawn from Africa, and it was not unfrequently called Gum Thuris, on account of its being brought by merchants from Thur or Thor, a port in the north bay of the Red Sea, near Mount Sinai. By the name *Thuris* it was readily distinguished by purchasers from *Gum Acacia*, or Gum Arabic, a product of *Acacia vera*, *nilotica*, and other species, which were chiefly exported from Suez.

The Greeks called this gum Λιβανος, *Libanus*, a word of the same import as *Labonah*, its Hebrew, and *Luban*, its Arabic appellation. The Arabs also called it *Cundur*, which name appears not to have been unknown to the Greeks, hence, some of their writers have used the term Κονδρω, when speaking of this article. The Hindu medical writers notice in their works a fragrant resinous substance, under the name of *Cunduru;* the Mahomedan writers, also, of India, mention the same, and both state it to be the product of a tree called *Salaci*, or *Salai*, common in the mountain forests in all the central districts.

The gum-resin collected in India is less pure than that received from Africa, and also differs from it in several other particulars; this may arise from the mode of collecting it not being the same, or from the situations in which the trees are grown, but more probably the African kind is the product of a different tree.

Neither Theophrastus, nor Pliny, or any other of the old Greek writers, agree in their descriptions of the trees producing this gum. The former, who lived 350 years before the Christian era, says, the tree is about five cubits high, full of branches, with leaves resembling those of the pear-tree, and a smooth bark, like that of the pear-tree. Other writers, however, about the same age, affirm it to be like the Mastick tree (*Pistacia lentiscus*), having reddish-coloured leaves, and branches and fruit like the Mastick. Others, again, contend that both leaves and bark resemble those of the Bay tree (*Laurus nobilis*). It is easily seen that all these authors had different plants in view, and each considered his the true incense-bearing one.

The opinion of Linnæus, which was adopted by most medical writers in his day, was, that it was the production of *Juniperus lycia*, a fragrant resinous plant, growing naturally in the south of Europe, with a habit very similar to the Savin (*Juniperus sabina*). On being wounded, like all other pinaceous plants, it exudes a transparent resinous gum, possessing a pleasant aromatic smell, but differs very materially, both in properties and appearance, from the true Gum Olibanum. The French physicians and chemists especially have turned their attention to this subject, and they have had ample opportunities of fully investigating it, as the shrub grows abundantly in the southern parts of their country. The unanimous conclusion has been, that

Juniperus lycia is not the true Olibanum tree, notwithstanding the high authority to the contrary.

Mr. D. Turnbull, Surgeon to the Residency of Magpur, in the East Indies, furnished some particulars respecting the tree which produced the Olibanum used in the Indian temples, which led to its discovery and identification. He accompanied Mr. Colebrooke in his route to Barar, in 1798, and during the journey they met with numbers of the *Salai* tree in the mountain forests between Sone and Magpur; on his return to the station at Mirzapore he procured large quantities of the gum, and forwarded it to Europe, where, on comparison with samples of the Arabian, although it was less pure, and differed in several minor particulars, it was universally decided to be the true Olibanum of commerce. And from this source in the present day the greater part of Europe is supplied. A subsequent examination of the tree has proved it to be the plant known to botanists under the name of BOSWELLIA SERRATA.

All the species of *Boswellia* are natives of India, and form *trees* of varied heights. They abound in a balsamiferous resin, with imparipinnate *leaves*, and nearly opposite serrated leaflets. The *flowers* are inconspicuous, and disposed in racemes and panicles, and their *fruit* is capsular.

BOSWELLIA SERRATA (figure *a*) forms a tree fifty feet or more high. *Branches* upright, smooth. *Foliage* crowded at the extremities of the branches. *Leaves* imparipinnate; *leaflets* 13 to 19, ovate, oblong, obtuse, taper-pointed, serrated, villous, on short downy *petioles*. *Racemes* axillary, simple, many-flowered, bracteate. *Flowers* hermaphrodite. *Calyx* monophyllous, five to ten-toothed, pubescent; teeth acute. *Petals* five, oblong-lanceolate, acute, of a pale rosy pink, with the edges incumbent in æstivation. *Stamens* ten, spreading, seated round a disk. *Disk* cup-shaped, fleshy, crenulate, coloured, adherent to the calyx. *Ovary* slightly triangular, three-celled; *ovules* solitary. *Style* short, capitate, somewhat trilobate. *Capsule* dry, smooth, triangular, three-celled, three-valved. *Seeds* broad, cordate, winged.

The wood is heavy, hard, and durable, and is used for various purposes. The tree is called by Colebrooke *Libanos thurifera*, and Roxburgh, in his "*Hortus Bengalensis*," (p. 32,) names it *Boswellia thurifera*. The resin is used throughout India, not only as incense, but also as pitch; for this purpose, being hard and brittle, it is boiled with some low-priced oil to render it soft and manageable.

BOSWELLIA GLABRA.—A deciduous tree, growing seventy or eighty feet high, also produces a similar gum, but its fragrance being less grateful, it is seldom used for any other purpose except as pitch . most of the India shipping are pitched with this. It is called by the natives of Coromandel *Gugulapootschittoo*.

Notwithstanding it has been clearly ascertained that the Olibanum used as incense in India, and supplied from that quarter to Europe, is the product of *Boswellia serrata*, the *Salai* of the natives, it is yet not equally clear, that all the gum used in Arabia and Egypt is supplied by the same tree, but rather the contrary, especially as until the discoveries made by Messrs. Turnbull and

Colebrooke, the whole of the supplies were understood to be received from Africa. Now we have no direct evidence to show that *B. serrata* has been found growing in a natural state, or even in a cultivated form in any part of Africa in sufficient quantity to yield even a small proportion of the gum used in those countries, and exported by them to other and distant nations, either in the time of the writers previously alluded to, or in any subsequent period. And yet the great supplies to Mecca and Cairo have been, and are still received from Africa along the deserts near the Red Sea; and if we add to this the acknowledged superiority of the Turkish gum, to that from India, it would seem to warrant the conclusion that it is the product of another and differently habited plant.

Now there has lately been discovered in the islands, and in the most sterile regions of the Continent of South-western Africa, a half succulent shrub growing in vast abundance, and producing a brittle resinous substance in considerable quantities, which is exceedingly fragrant, especially when burnt; this gum-resin is collected as stated to be the incense of Africa. And, from what we have seen of it, there does not appear to us to be any perceptible difference betwixt it and the best Olibanum of the shops. Its habit is singular, and during the season of repose, when destitute of leaves, it has the appearance of a shrub of coral, and spreads its short leather-coated branches upwards like a candelabra. It is a plant of the composite order, and nearly related to those fleshy-stemmed shrubs from the Cape of Good Hope, which were formerly called *Cacalias*, but are now referred to the genus *Kleinia*. On the summit of the rugged branches grow a cluster of spathulate, bright green, veinless, somewhat succulent leaves, and from their axils a few solitary flower-heads of a pale yellow colour, placed on stalks scarcely so long as the leaves.

It is not, however, a *Kleinia*, nor does it belong to any genus hitherto defined, but is a member of the division called by De Candolle, ERECHTHITEÆ. It differs from *Faujasia* in the want of a calyculus, and in its abundant pappus; from *Eriothrix* in its involucre not being leafy; from *Stilpnogyne*, in all the achænia bearing pappus; from *Erecthites*, in the achænia not being rostrate, in the pappus being rough, in the florets of the ray not being toothed, and in the branches of the style not being terminated by a cone; and finally, from *Cremocephalum*, in the involucrum not being many-leaved and calyculate, the achænia not being ribbed, and the receptable not being fringed and thickened at the base. It is possible, however, that some of the plants doubtfully referred by De Candolle to Kleinia may belong to the same genus, especially his *K. acaulis* and *subradiata*. It is named CERADIA in allusion to the horned appearance of its branches; from κερας, *keras*, a horn; and *furcata*, from the singular forking of the branches; and its English appellation, *Coral*-bush, from the resemblance of the plant, when in a leafless state, to real coral.

Little doubt rests on our mind but the above is the identical plant which furnishes the Frankincense of Arabia. The gum exudes in small pellucid tears or drops, like that of *Boswellia serrata*; it is of a pale yellow colour; it is somewhat hard and brittle; it has a slightly bitter and fragrant resinous taste; it possesses a peculiarly rich and durable aromatic smell, and when burnt, its perfume is refreshing and may be perceived at a great distance. All which characters exactly agree with Olibanum.

From its being a Composite, it would spread to an almost unlimited extent; and by being half-succulent, and delighting in arid situations, it would adapt itself to almost any barren locality, and would flourish in desert tracts where the *Boswellia serrata*, a native of the humid forests of India, could scarcely retain life many days after planting.

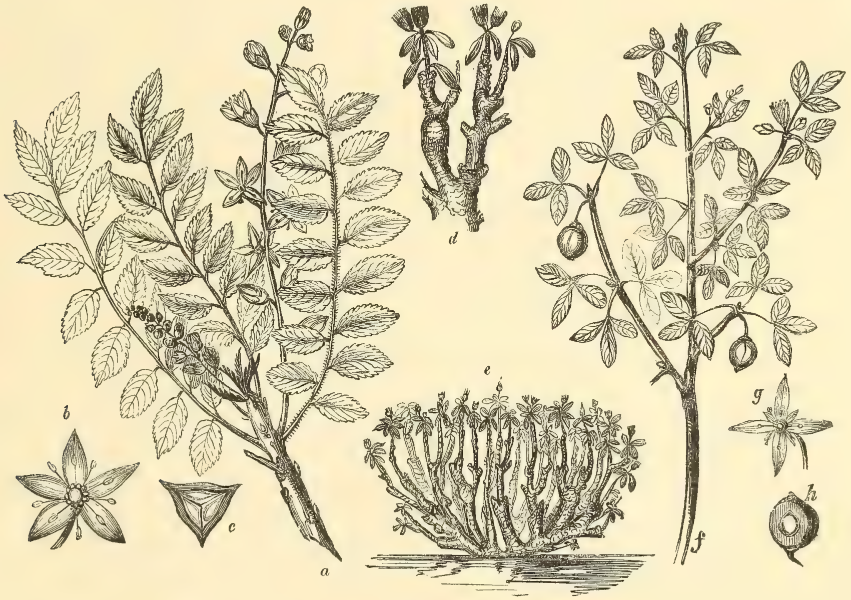
It is a plant of slow growth with us, and perhaps will never exceed in height four or five feet; its branches spread widely, and at the season when the sap begins to flow freely, it exudes a large quantity of clear gum. It requires the temperature of the greenhouse, and is of the easiest culture; pot it in a well-drained soil, composed of half light loam and half sharp sand. Very little water must be administered at any time, but especially during the winter season. Increase is readily effected by separating the branches just before the season of growth, and when half dry, planting them in pots filled with the same soil in which the parent plant is potted.

For the first discovery and introduction of this singular plant we are indebted to Mr. George J. Brown, the chief officer on board the merchant-ship *Zenobia*, who, in 1844, whilst in connexion with that vessel, visited the western coast of Africa, and during a short trip into the interior of the Desert, found these plants growing in situations where vegetable life could scarcely be expected to exist; and as the part had not before been visited by Europeans, he was induced to collect specimens, of which one living plant arrived in this country in August 1844, which was presented by him to His Grace the Duke of Devonshire, in whose collection, at Chatsworth, it has since been grown, and has now become a low spreading bush eighteen inches high.

Specimens of it have subsequently been brought from the Island of Ichaboe by the wife of a ship's captain, who visited the Island. One of these dead branches was furnished by Dr. Maclagan, of Edinburgh, to Dr. Lindley, who on examining and burning the resin sticking to the branch, could not perceive that fine perfume which the gum of our plant exhales. It has since found its way into the nursery of Messrs. Rollisson's, at Tooting, and other nurserymen around London, and will probably soon become common.

Too little is at present known of the vast continent of Africa to admit of a correct opinion being formed of the extent of the geographical distribution of this plant; but there is little doubt that it is widely spread over much of the Desert parts, and perhaps inhabits all the islands on the south-west contiguous to the coast. As it belongs to the Composites, seeds profusely, and the seeds are furnished with means of easy transmission from place to place, its diffusion would be greatly affected by the Monsoons, especially during the hurricanes, which always attend the commencement of their changes. The south-eastern current one half the year would carry the seeds across the wide Desert-regions to the borders of the Red Sea, and the Desert-plains of Arabia. And again the north-western, which blows the other half of the year, would carry them across from the Continent to all the islands near the south-western coast; so that it is probable few parts could be traversed within the range of the tropics, where this plant might not be found.

There is, however, another plant, a native of Africa, and found in various districts in Arabia Felix, which has received some attention from modern travellers, and has by them been considered as the true African *Bdellium* or frankincense tree. It belongs to the same natural order as *Boswellia,* but is a member of a different genus. It has been named by botanists—



DESCRIPTION OF THE WOOD-CUT.

a Branch of *Boswellia serrata,* or Indian Frankincense Tree, showing the pinnate leaves and inflorescence, one-fourth the natural size.

b Detached flower of the same, exhibiting the ten stamens, serrated round the cup-shaped disk, half the natural size.

c Ripe capsule cut through the centre to show the three cells, and triangular form.

d Detached branch of the plant of *Ceradia furcata,* the Arabian Frankincense, one-sixth the natural size.

e Appearance of the plant of *Ceradia furcata,* when in flower at Chatsworth.

f Branch of *Balsamodendron Africanum,* the supposed African Frankincense, showing its trifoliate leaves, inflorescence, and globular drupes.

g A detached stamineous flower, showing the four petals and eight stamens seated round the cup-shaped disk.

h The drupaceous fruit cut in half, to show the seed in the centre.

Balsamodendron africanum.—It is said to form a spreading shrub, fourteen or fifteen feet high, with slender but rigid furcate *branches. Leaves* small, palmately trifoliate; *leaflets* sessile, smooth, serrated towards the point. *Flowers* of separate sexes, produced in twos and threes. *Calyx* four-toothed, persistent. *Petals* four, linear-oblong, acute, of a pale rose colour. *Disk* cup-shaped, with elevated warts.

Stamens eight, inserted round the disk. *Ovary* round, one or two-celled. *Style* short, capitate. *Fruit* a globular two-celled, or by abortion one-celled, drupe. *Seeds* solitary.

About the beginning or middle of April the plants are wounded, and the gum oozes from the gashes, and drops into vessels placed beneath to receive it. An inferior kind is also made by boiling the twigs, and skimming off the resin as it rises to the surface of the water. From the description given of this genus, however, it can scarcely be identified as true Olibanum, although no doubt often used for the same purposes, or even mixed with it for exportation. There is more probability in the supposition that it is the article known to us by the name of Gum Myrrh. Nees Von Esenbeck has named the plant producing this drug *Balsamodendron Myrrha.* From its description, however, it is not probably distinct from *Balsamodendron Kataf* of Kunth. As, however, the Myrrh plant will form a subject in a future number, we conclude our remarks by calling upon the commercial world, those especially trading to Ichaboe and other African islands, to bestow a little of their attention to this interesting subject, as if our conjectures prove correct, they will be able, by importing a quantity of pure Olibanum, to render their cargoes still more valuable and lucrative than they are at present.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE LEADING BOTANICAL PERIODICALS FOR MARCH.

Achimenes ocellata. Eyeletted Achimenes. Roots of this beautiful new Achimenes were sent from the Isthmus of Panama, by the Government collector and naturalist, of H. M. S. *Herald,* Mr. Seeman. It promises to be a great ornament to our collections, and will, in the summer, we cannot doubt, flourish in a cool greenhouse. The leaves, too, are handsome, and of a very full green colour, purple below, and a deeper purple is on the stems and petioles.—*Bot. Magazine,* 4359.

Aristolochia anguicida. Snake Birthwort. A singular and very little-known species, a native of New Grenada. Jacquin discovered it at Carthagena. Mr. Purdie sent it to the Royal Gardens of Kew, where it first flowered in December, 1845. As the natives of North America employ the *A. serpentaria* for destroying serpents, and also for curing persons bitten by those reptiles, so the natives of South America (New Grenada) employ this for similar purposes. "The juice of the root," according to Jacquin, "mixed with the saliva by mastication, renders powerless a serpent of moderate size, if one or two drops are put into the mouth of the creature, when it may be handled and put into the bosom with impunity, but after a time the animal recovers ; a larger quantity, however, occasions its death." Jacquin attributes to the odour of the root the faculty of driving away serpents when they approach this plant ; and he also relates that the juice, applied to the recent bite of a serpent, or taken internally, infallibly cures the patient. The habit of the plant is slender and twining, and the flowers are small, yellow, and dashed and spotted with brownish-red. *Bot. Mag.,* 4361.

Cuphea silenoides. Catchfly Cuphea. A rather showy, hardy, purple-flowering annual. It was introduced some years ago to the Botanic Garden of Breslau, from Mexico, by Dr. Nees Von Esenbeck, through M. De Bergher, and has since become common in our gardens. It is well-suited for a flower border, and an entire bed filled with it has a very pretty effect. The seeds are best raised in a hotbed.—*Bot. Mag.*, 4362.

Lycoris straminea—Straw-coloured Lycoris. A pretty bulbous plant, received by the Horticultural Society from Mr. Fortune in 1845, from China. It is apparently as hardy as a Narciss, and grows freely in any good rich garden soil. Increase is effected by offsets from the old bulbs. If it should prove quite hardy, it will be desirable for the flower-garden.—*Hort. Journal*, vol. iii, p. 76.

NEW, RARE, OR INTERESTING PLANTS IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Acacia rotundifolia. We have been favoured with a specimen of the above-named Acacia from Messrs. Hugh Low, Clapton. It is a most graceful and ornamental little plant, hanging over the pot in long branches most abundantly covered with globular blooms of a rich yellow, and produced in twos and threes at the axils of the leaves, so densely as almost to hide its very neat and bright glossy green foliage. The plant does not appear to be a large grower, and in that respect will be a decided acquisition. Mr. Low conjectures it was introduced by Mr. Drummond from New Holland.

Camellia seedling *var.* In the nursery of Messrs. H. Low, Clapton, we found two very remarkable and handsome seedling Camellias. Messrs. L. have been singularly successful the last few years in producing fine flowers with the addition of large and handsome foliage, and this year they do not lag behind. The first one they name *C. caryophylloides* from the beauty and regularity of the flakes or stripes down the petals ; it has a blush-coloured ground, with the flakes a much deeper tint ; the flower is about four inches across, very double, and well filled up to the centre. The other flower is not so full of petals, but it has a singular attraction in the richness of its colour. It is, like the former, a striped variety, but it has a rich rose ground with the stripes approaching a deep scarlet. The habit is that of *C. Donkilaarii* ; the first is much the stronger growing plant, with foliage large and handsome.

Cattleya Skinneri. In the Gardens of the Horticultural Society, Chiswick, this handsome species is now flowering in great beauty ; the specimen exhibits upwards of a dozen fine heads of bloom, well coloured and expanded. We cannot avoid expressing our admiration of plants like this ; annually do we notice the enlargement and increasing beauty through careful and attentive cultivation, producing an additional amount of bloom, which fully compensates the cultivator for the long period it takes to gain such a specimen as the one under notice.

Dendrobium spe. nov. Mr. Carson, gardner to — Farmer, Esq., Nonsuch Park, Cheam, Surrey, favoured us with a flower of a most lovely Dendrobium. The habit is much like *D. densiflorum*, though the pseudo-bulb is more angular, and the flower-scape not quite so densely laden with bloom. The flower is a most delicate one, the outer petals being a peach-blossom colour, while the side petals and labellum are a pale straw-colour beautifully fringed at the edges ; the latter is rendered more attractive by a large blotch of the richest and deepest yellow, almost an orange. We can safely conjecture that it will be one of the most charming species yet introduced, as no doubt it will prove a profuse bloomer.

Eriostemon nereifolium. In the garden of R. Barclay, Esq., Leyton, Essex, under the careful management of his gardener Mr. Kyle, is a very handsome specimen of the above, most profusely decorated with white blossoms, delicately tinged with pink. The plant was near five feet high, two feet at the base, tapering to the top. Messrs. Henderson, Pineapple-Place, Edgeware Road, have a fine specimen much older than the above, very well flowered.

Fuchsia spectabilis. At the late meeting of the Horticultural Society in Regent Street was exhibited by Messrs. Veitch and Son, Exeter, a most remarkable Fuchsia both for size and colour ; Messrs. Veitch received the plant from their collector Mr. Lobb, who found it on the mountains of Peru, about six or seven thousand feet above the level of the sea. The flower is about five inches long, spreading at the mouth to an inch-and-a-half. The calyx is a rich red, almost scarlet, while the corolla is bright crimson, turning outward at the edges ; the flower is rendered more striking by the large white stigma and anthers. The bloom is produced singly, at the axils of the leaves of which there are three at each joint, large and handsome, about six inches long and four broad, tapering to each end, serrated, and of a dark and glossy green, the under side being tinged with chocolate colour. The plant is said to grow about three or four feet high, sending out branches in profusion, so that no doubt it will become a general favourite.

GLOXINIA TEUCHLERII. In the Nursery of Messrs. Rollisson's, Tooting, we noticed this most curious hybrid variety of the Gloxinia. The flower partakes of the colour of both its parents, not blended, but distinct in flakes, alternate, blue, and pink, each colour pure and bright, as in the parent plant. The pink becomes the richest crimson on the lower petal. Should the plant continue true to this character it will be the greatest favourite of all this very beautiful and ornamental race.

HENFREYA SCANDENS. We noticed a very fine plant of this species in the Nursery of Mr. Glendinning, Chiswick, from four to five feet high, completely laden with clusters of almost white flowers. It was introduced by Mr. Whitfield from Sierra Leone, and has a very handsome foliage of a rich, dark-green colour. We found it flowering in the following gardens and nurseries; though not such fine specimens, still the individual flowers were larger: in the Horticultural Society's Gardens; Messrs. Rollisson's, Tooting; and in the nursery of Mr. Ayres, Brooklands, Blackheath Park.

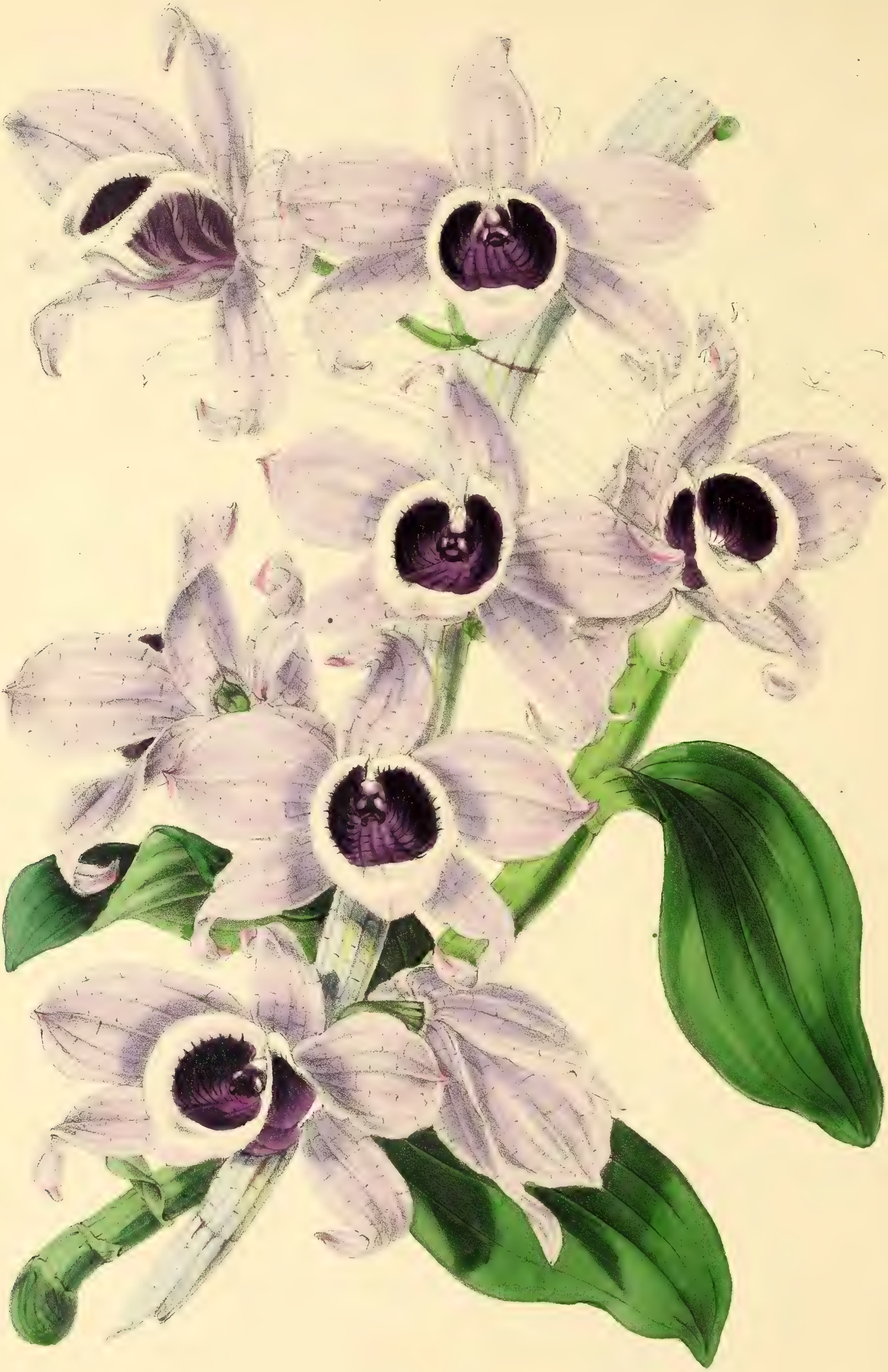
OPERATIONS FOR MAY.

MAY is proverbially the month for flowers: vigorous growth should be encouraged by every possible means. Insects, especially the various species of *Aphis*, will, if easterly winds should prevail, become very numerous and annoying. In plant-houses, an easy remedy is tobacco-smoke, but this should always be applied after the the rays of the sun are off the house; many choice plants have been irrecoverably lost for the want of this precaution. Out of doors remedies are more difficult of application, and are sometimes attended with only partial success. In the Orchid-house keep the air very humid, and syringe the plants freely. A very brisk heat is now advantageous, with air, whenever it can be admitted without injury. As to the proportion of heat and moisture required by different plants, however, there are many exceptions to the above rule, amongst which may be mentioned the various species of *Aspasia*, *Lœlia*, *Cattleya*, *Barkeria*, *Mormodes*, *Odontoglossum*, *Cypripedium*, *Renanthera*, and some species of *Oncidium;* these all thrive better in a moderate heat, a free circulation of air, and an intermediate proportion of moisture. Slugs, woodlice, cockroaches, thrips, scales, and mealy-bugs, must be now expected as troublesome guests, and must be looked after accordingly.

Stove-plants generally may be treated liberally with heat and water, to induce or promote a vigorous and rapid growth.

In the greenhouse and conservatory, keep climbing plants well tied in as they advance in growth, and abundance of bloom will be the result. Camellias, which have now formed their flower-buds, should be placed in a sheltered and shady situation out of doors. If exposed to the sun's rays, the leaves will become brown and blotched. *Pelargoniums* should receive daily a little weak manure water. *Ericas* should have the ends of their shoots nipped off with the finger and thumb, to render them bushy and spreading. *Cinerarias* as they go out of flower should be cut down. Balsams and other tender annuals must now be brought forward as quickly as possible, to occupy the places of such plants as are placed out of doors. Give liberal shifts to such plants as require it before the roots become matted. A free ventilation is of great importance, and closing with a humid atmosphere early in the evening is excellent for promoting vigorous growth. Tree and Neapolitan violets, for flowering throughout the winter, should be increased at this time.

In the open garden, the latter part of the month will be occupied with filling up the borders and bed with *Fuchsias*, *Pelargoniums*, *Verbenas*, and other autumn-flowering plants; do not forget *Plumbago Larpentœ*, *Cuphea platycentra*, and *Salvia oppositifolia*; the first and the last are new and very good.



S. Holden del & Lith.

Dendrobium anosmum.

DENDRÒBIUM ANÓSMUM.

(Scentless Dendrobe.)

Class.
GYNANDRIA.

Order.
MONANDR

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

GENERIC CHARACTER.—*Sepals* membranaceous, erect, or spreading; lateral ones largest, connate with the column at the base. *Petals* often much larger than the sepals, sometimes smaller, always membranaceous. *Labellum* jointed, or connate with the foot of the column, always sessile, undivided or three-lobed, commonly membranaceous, sometimes appendiculate. *Column* semi-cylindrical, much prolonged at the base. *Anthers* two-celled. *Pollen-masses* four.

SPECIFIC CHARACTER.—*Plant* an epiphyte. *Stems* strong, pendulous. *Leaves* ovate-oblong, obtuse, distinctly nerved, subcordate at the lower part. *Sepals* ovate-lanceolate. *Petals* oblong, or oblong-lanceolate, somewhat wavy. *Labellum* somewhat rounded, acute.

AUTHORITIES AND SYNONYMES.—Dendrobium *Swartz;* D. anosmum *Lindley,* in *Bot. Reg.*, v. 31, 41 *descrip.*

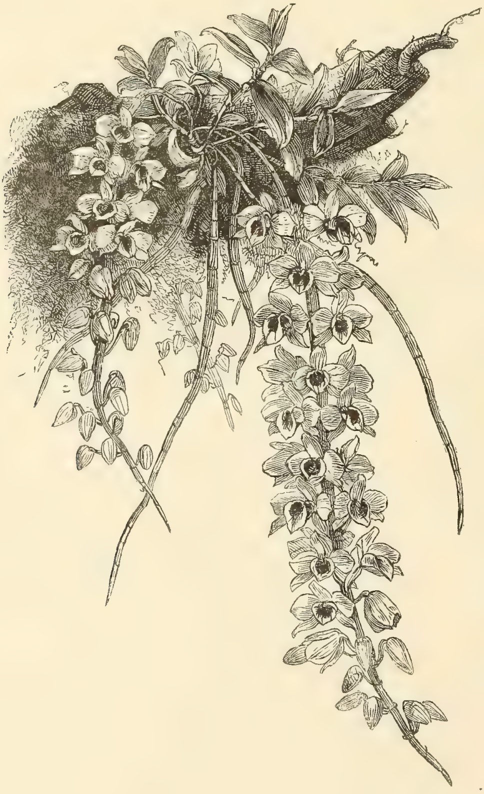
THIS very handsome plant exhibited its charming flowers in the nursery of Messrs. Loddiges, Hackney, in May, 1847, when our drawing was made. It approaches very near to *Dendrobium macrophyllum* of Mag. Bot. vol. viii., t. 97, *D. macranthum* of Hooker's Bot. Mag., t. 3970, and might possibly prove only a variety of that species. That eminent botanist, Dr. Lindley, has the following remarks respecting it in his Botanical Register, vol. xiii., p. 41, *Description.* Although the plant resembles *D. macrophyllum,* yet "1. its flowers are scentless, not having the strong odour of rhubarb, like those of *D. macrophyllum;* 2. they are of a smaller size; and 3. all the divisions of the flower are shorter, broader, and even, instead of undulating. Whether or not it is really a species experience will show: it is at all events a remarkable variety."

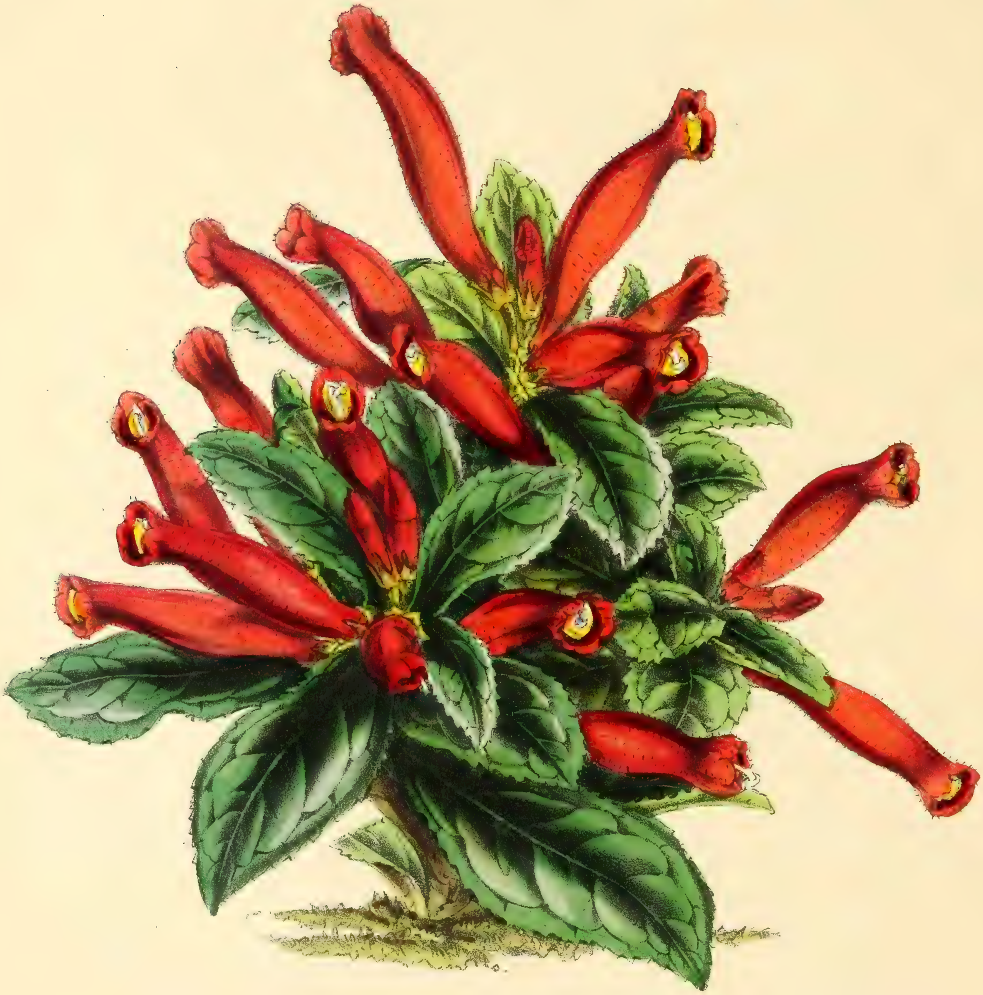
D. anosmum belongs to that class of Dendrobes usually termed caulescent; the stems grow a foot or eighteen inches long, are slender, pendulous, and whilst young of a yellow green, and covered with strong leaves; when the stems ripen, the leaves are shed, and towards the extremities of the naked stems the flowers are produced in pairs, on short peduncles. Our drawing gives a good idea of them; they are of a delicate lilac colour, relieved by a deep crimson-purple labellum, the latter having a narrow margin of pure white, and the annexed woodcut is an excellent illustration of the habit of the plant.

Messrs. Loddiges imported this handsome plant from the Philippine Islands in 1840.

In cultivation, it should be either attached to a block of wood or placed in a basket filled with rough peat and sphagnum, and hung from the roof of the orchid-house, as its character and habits suggest the propriety of elevating it, either above or on a level with the eye. It should be placed in a very warm temperature, and supplied with abundance of moisture whilst in a state of growth; but when at rest treated like other Dendrobes with similar habits. It is easily increased by separating pieces of the old stems whilst in a state of torpidity.

The generic name is derived from *dendron*, a tree, and *bios*, life; because the species are generally found growing on trees.





[illegible]

Conradia floribunda

CONRÁDIA FLORIBÚNDA.

(Many-flowered Conradia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERAĈEÆ.
(Gesnerworts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* wholly adnate to the ovarium; limb five-cleft or five-toothed, free. *Corolla* superior, tubular or campanulate; limb somewhat equally five-cleft. *Stamens* four, didynamous, with the rudiment of a fifth behind. *Anthers* usually cohering into a round head. *Glands* or *disk* wanting. *Capsule* dry, clothed with a five or ten-ribbed calyx, flat on the top, two-valved. *Placentas* two, parietal, many-seeded. *Seeds* scobiform. *G. Don.*

SPECIFIC CHARACTER.—*Plant* a dwarf evergreen shrub, with a neat habit. *Branches* scattered and spreading. *Leaves* petiolate, alternate, ovate-lanceolate, serrated, somewhat rough, of a rich green. *Cymes* many-flowered, on peduncles arising from the axils of the leaves. *Calyx* campanulate, five-toothed. *Corolla* cylindrical, *tube* an inch-and-a-half long; *limb* irregularly five-cleft. *Stamens* a little exserted. *Anthers* connected by pairs. *Capsule* dry, cylindrical.

AUTHORITIES AND SYNONYMES.—Conradia *Mart. Nov. Gen. Bras.*, 3, p. 38. Gesnera *Swartz, prod.* 89.

OF this beautiful genus of Gesneraceous plants eight species are known, all natives of the West Indies and South America: four of these have been introduced, of which the subject of our present plate is the last. In November, 1847, it produced its handsome scarlet flowers in the nursery of Messrs. Knight and Perry, Chelsea, when our drawing was permitted to be made.

The habit of the plant is very neat, the leaves being small, and of a varied and rich green; it also flowers freely, specimens two inches high, and four inches diameter, having upwards of a dozen flowers expanded at one time; and the period of blooming is also of long continuance. The size of the flower, its deep and rich scarlet colour, and the manner in which it protrudes itself from amongst the fine green foliage, make it one of the prettiest little plants we have lately seen.

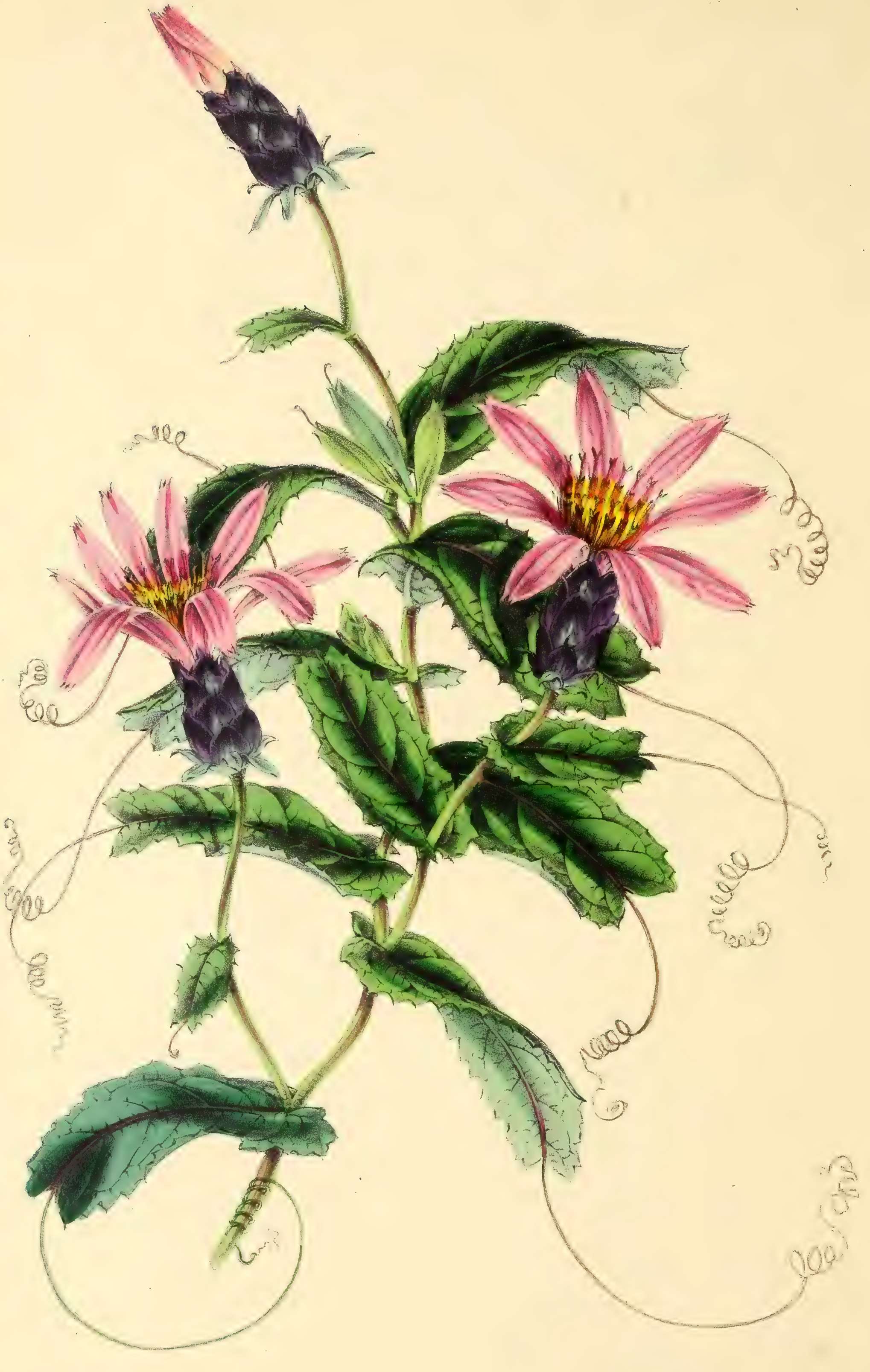
It requires the temperature of the stove, with much the same general treatment as the various species of Gesnera; namely, to be potted in a light rich vegetable mould, or a mixture of loam, peat, and sand.

Like all other Gesneraceous plants it requires very good drainage: fill one-fourth of the pot in which it grows with broken crocks, and if a few were mixed with the soil it would be advantageous.

When the plant is in full growth, give a liberal supply of water and plenty of light, but during the season of torpidity, water carefully.

Propagation is effected by cuttings of the half-ripened wood, planted in pots of sand, and placed in a moist heat.

The generic name is given in honour of Conrad Gesner, an eminent botanist of Zurich, and the specific appellation, from the number of flowers which are produced at one time.



S. Holden Lith

Mutisia ilicifolia?

MUTÍSIA ILICIFÒLIA.

(Holly-leaved Mutisia.)

Class.
SYNGENESIA.

Order.
POLYGAMIA SUPERFLUA.

Natural Order.
ASTERÀCEÆ.

Generic Character.—*Involucrum* cylindrical, imbricated, clothed with scales; scales lax. *Receptacle* naked. *Florets* of the disk hermaphrodite, tubular, five-toothed, separating at the top into two to five equal segments, or three unequal ones. *Anthers* bisetose. *Florets* of the ray feminine, two-lipped, outer lip ligulate, tridentate; inner one smaller, bipartite (rarely entire or none); rudimentary filaments five.—*Hooker, Bot. Mag.*, v. liv., t. 2705.

Specific Character.—A scandent plant, rising to a considerable height. *Stems* and *branches* angular. *Leaves* alternate, cordate, aculeate at the edges, exstipulate, nearly sessile, the midrib continuing in the form of a long tendril, slightly downy whilst young, but becoming glabrous when old. *Peduncles* axillary, long, with two or three small ovate-lanceolate *bracteæ*, and bearing a single large showy flower. *Involucre* long, cylindrical, consisting of four tiers of loose scales. *Florets* of the ray, ten, female, each composed of a long slender tube, two-lipped, the lower lip ligulate, of a beautiful purple colour, the inner one small, cut into two narrow revolute segments. *Style* long. *Pappus* feathery, more than half the length of the floret. *Florets* of the disk tubular, yellow, five-parted at the apex. *Anthers* long, yellow-green, longer than the tube of the floret, each having two long setæ at the base.

At least twelve species of this pretty genus have been described, but only three are yet introduced. All are deserving of cultivation, and our present subject is by no means the least interesting.

It is a native of Chili, whence it was introduced a few years ago by Messrs. Hugh Low and Son, of the Clapton Nursery; and although it has by them been sent to various parts of the country, it is yet far from common.

The plant is a neat-growing evergreen, with hard leaves like those of a holly, a creeping habit, and is a free flowerer; and although its flowers are less showy than those of some other plants, yet being nearly hardy, of easy culture, forming a good evergreen cover against a wall, and not being liable to become naked at the bottom, are merits which ought not to be lost sight of.

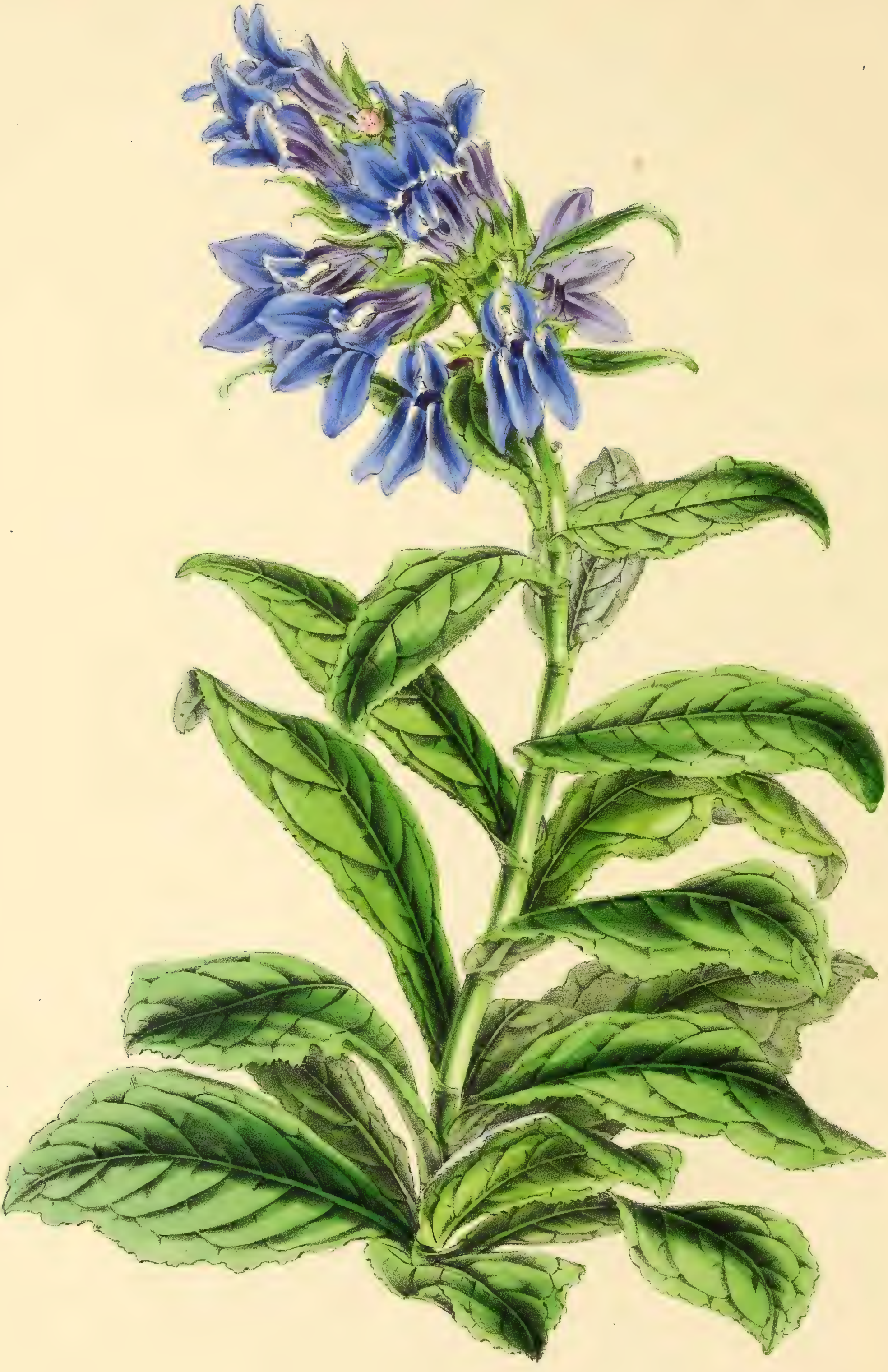
We are indebted for the figure from which our plate was prepared to Mr. John Roy, jun., Aberdeen, who some years ago received a plant from Messrs. Low and Son, which was planted against a south wall in his garden, and has flourished there ever since, without any other protection than that afforded by the wall. The drawing was made by a young lady resident in the neighbourhood of Aberdeen.

Although flowering freely every year, it has not yet ripened seeds; that gentleman has therefore propagated it by cuttings, which strike root freely if planted either in sand or soil, and the pots placed under a glass in heat.

After becoming established in the ground for a few years it is removed with difficulty, and if allowed to form too much top, it should be moderately thinned, as otherwise it would be injured by bleeding.

The soil which appears to suit it best is peat, without any admixture of loam, in which it will make an annual growth of four feet in length.

The genus is named in honour of Celestine Mutis, a South American botanist.



S. Holden, del & Lith.

Lobelia cœlestis.

LOBÈLIA CŒLÉSTIS.

(Heavenly-blue Lobelia.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
LOBELIÀCEÆ.
(Lobeliads, *Veg. King.*)

Generic Character.—*Magazine of Botany*, v. xv., t. 7.

Specific Character.—*Plant* a herbaceous perennial. *Stems* slender. *Leaves* sessile, scabrous, decurrent. *Peduncles* long, hairy. *Flowers* axillary, solitary, of a rich azure-blue, disposed in a long leafy terminal raceme. *Calyx* five-toothed, somewhat reflexed. *Corolla* angular, segments nearly equal. *Keel* ciliated.

Authorities and Synonymes.—Lobelia *Linnæus ;* L. cœlestis *Don's System*, 3. 706 ; L. crispa *Graham.*

This very pretty and dwarf-habited plant is a native of North America, and has been in our collections since 1831; its long racemes of bright cærulean flowers, the freedom with which they are produced, and the height of the plant seldom exceeding nine inches, render it an excellent subject for bedding out in the flower-garden; and, being an herbaceous plant, and nearly hardy, it will when better known be considered quite an acquisition.

In many particulars it resembles *Lobelia syphilitica*, but is decidedly a distinct species. Our drawing was made from a specimen which flowered in the nursery of Messrs. Knight and Perry, King's Road, Chelsea, in October 1847.

This species of Lobelia grows best in light rich soil, or peat and sand, and is easily increased both by cuttings and division of the roots.

Being a plant of delicate growth, care must be used in watering whilst the plants are small, but when large and in vigorous growth a liberal supply may be given.

For the derivation of the generic name and general treatment of Lobeliaceous plants, see "Mag. Bot." t. vii. of the present volume.

THE SCIENCE OF HORTICULTURE.

We have occasionally had to apologise for the discursive nature of our papers; but there are general principles which equally apply to the garden and the field, and unless these be appreciated, scientific culture cannot be adopted. All effects are dependent upon causes; therefore, we cannot err in adducing any theory or fact which tends to elucidate those causes.

Every garden ought to be thoroughly drained, otherwise no dependence can be placed upon it; cultivation cannot proceed healthily; and even common security becomes very questionable: of this latter fact the writer once met with a proof equally unexpected and lamentable. A noble garden—one that bore convincing marks of an antiquity, referring to the period of Abbey lands and "Granges"—was under the direction of a very able gardener, who had every appliance at command for the production of fruits, and the best parterre flowers: the soil is naturally a strong and rather binding loam, reposing upon a stiff, cold, and unwrought subsoil; drainage had had no existence—never was once thought of. The winter of 1843—4 was protractedly wet, the land could not absorb or carry away the superabundance of water, and, as the subsoil of the garden in question was little better than an impenetrable "pan," the water reached, and actually blew up the interior of all the pine, melon, cucumber, and flower pits. We saw the tan and leaves floating, the pots disturbed, turned on one side, and liable to the greatest injury. Fruit trees also suffered, and became sickly. By great assiduity and exertion, some portions were drained; and to make up for imperfect depth of soil, large quantities of free-working turfy loam had been, and still are, brought in from a common; but no efforts, no extra labour, can prove a substitute for perfect drainage.

The Regent's Park, it was stated, required drainage to the depth of eight feet, ere the soil could be duly meliorated for the establishment of the Royal Botanic Garden; and this leads to the remark, that drains opened to a certain depth act by the ramifications of fissures which they produce in clays and binding loams. These earths contract by drying, in the manner of the clay paths in fields—wherein any person can observe cracks, which open, and continue to enlarge, during hot and drying weather. As subsoil drainage carries off, at first, some water, the outer surface of clay gradually contracts, more water is freed, the cracks extend inwardly, and thus many feet of earth become intersected by permanent fissures, and the land is effectually relieved from stagnant water.

Plants cannot be maintained in complete health without an adequate supply of appropriate food; hence the necessity of a renewed soil. But how are this food, and the individual claims of vegetables to be discovered? Organic Chemistry has taught us that oxygen, hydrogen, carbon, are common to all vegetable bodies, and to these the fourth organic element, nitrogen, is occasionally added. These are all resolvable in aërial gases, and as such are invisible: they are "self-restoring," as a modern writer justly observed, and are also susceptible of amazingly numerous modifications. This is shown in the analyses of that excellent little work, "Fownes' Manual of Chemistry." But those constituents also which are termed inorganic, are, or may be rendered visible to the eye—and, as in the case of the mineral alkalies, soda, potassa, and their neutral salts—are chiefly derivable from the soil. The laboration and culture of the ground gradually remove these salts, because vegetables, by each taking up its specific supply, deprive the earth of the quantity naturally contained in it. Manures restore the organic elements, and some of the salts, but deep tillage is the process indicated by nature to bring up, and into activity, the store of alkaline and earthy elements that abound in subsoil-loams. "The subsoil of the best London market-gardens has been gradually dug up five feet deep to supply the waste of mineral matter to the richly-manured soil above." If this last asserted fact be true, how greatly do they err, who, in field or garden, are content with stirring and turning over the ground, year after year, to the depth of six or eight inches. "It will never do," say they, "to bring up a poor and heartless earth, that has never been exposed to sun or air; it would be useless and unproductive for years." (!) We advise them to make the attempt, cautiously and by progressive degrees.

For parterre-planting and bedding-out, deep tillage is essential. Every bed upon a lawn ought in the first instance to be at least eighteen inches deep of good unctuous but not binding loam for the Pelargoniums, Calceolarias, and other strong-rooting tribes. Heath-soil with a portion of very light fibrous earth, like that of Mitcham Common, is required for the American and hair-rooted shrubs. Leaf-mould is admirable for Lobelias. These are general facts familiar to the best practical gardeners, who however know little of causes or agencies. But what *must* be insisted on, is the necessity to remove and renew these parterre soils yearly, after the two or three first years. Fresh soil, be it of what character it may, is the *sine quâ non.* Manure will not answer, it may stimulate, but will not confer that magnificence of verdure and colour which are so remarkable in some gardens. One of these we have in view, where there was constantly a store of fresh pure loam from meadows, kept in heaps exposed to the weather, and this was blended with about one-third part of old horse-droppings, taken from the boxes of the mushroom-house for the loam-parterre plants. Every bed was dug out in the early spring, and refilled with its appropriate earth; and the effect produced was most splendid. Mr. Loudon bore testimony to the justness of this practice, when visiting Taplow House, Bucks; (see *Gardeners' Magazine*, vol. ix., p. 659.) He wrote—"We were particularly struck with the vigorous growth of every description of plant introduced into the flower-beds; and we were informed of the cause, viz., that the gardener takes out the soil every year to the depth of two or three feet, and renews it entirely. He does not introduce a single bed, or even a single plant, however common may be the kind, without this precaution."

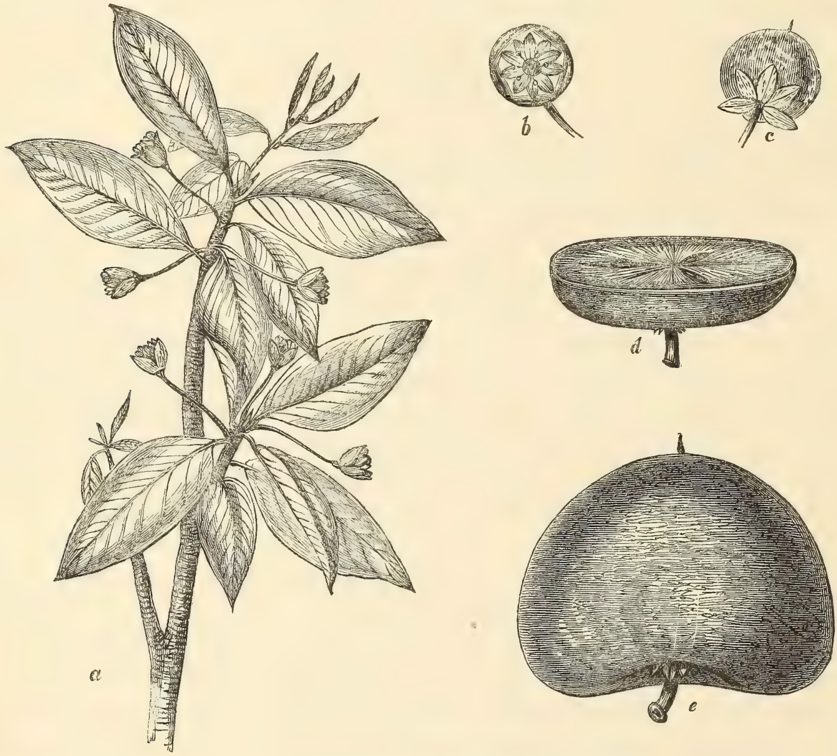
To be a little more explicit, we may suppose that all loams contain a portion of the vegetable alkali, known in trade by the term Salt of Tartar, or pearl-ash. This salt exists neither in the air nor in water; yet the whole that is imported from America and the North of Europe is obtained from the ashes of trees burned in the native forests. Therefore, it is more than probable that the soil is the storehouse of the whole. Potash and flint unite, and produce what chemists call Silicate of Potass, and this can be traced in loams. Lime acts upon this natural Salt of Potash, and such of our plants which affect it, take up their constitutional supply from the ground: the same may be said of all the mineral salts,—soda, common salt, the phosphate of lime, &c., &c. One remarkable fact related by Mr. Hoskyns, in a letter to the Hereford Agricultural Society, is worthy of record and serious consideration; it is to the following purport:—

Mr. Hoskyns once visited the Island of Madeira, where, as every one knows, the celebrated wine which bears that name, alone is produced. He ascertained, however, that the vines deteriorate by lapse of time, and no longer yield grapes equal to the object of the grower, the wine being of inferior quality. It is well known to chemists that a certain deposit is formed during the mellowing of wines that require to be kept long in the vats, and this gradually assumes the figure of crystalline masses. These, when detached, become an article of commerce, under the name of *argol*, or crude tartar, and, when purified and re-crystallised, "*cream of tartar;*" this salt is a true bi-tartrate of potash, consisting of two proportionals of tartaric acid and one proportional of the vegetable alkali or potash. The acid is the product of an organic process within the vine, from the organic elements, oxygen, hydrogen, and carbon; it is the essential, proper acid of the vine, but it appears to require its specific equivalent of potassa to enable it to prepare those juices which are essential to the process of wine-making. The soil of Madeira becomes exhausted of its potash, and when this loss is effected, the vineyards must be renewed. Mr. Hoskyns saw the labourers at work, trenching and excavating to the depth of seven or eight feet; and upon strict inquiry, he ascertained that by thus bringing up soil from a great depth the trees were restored, and the juice of the grape perfected. The islanders had no other ready means at command, but by labour they were able to effect the desired object. We may not be able so to explain the rationale of the process (even admitting that potash is really present in the earth) as to direct the renewal of the soil by artificial means. Potash could, with the utmost facility, be incorporated; but the knowledge of analytic results in the laboratory will not elucidate the secret operations of natural electro-chemistry. We know sufficient to authorise the most refined and rigid experiments; but at present, we must not affect to appreciate the mysterious phenomena of nature; hence the application of saline manures ought always to be made with extreme caution, and on a restricted scale, otherwise much injury may be done. Knowledge is on the advance, and hopes may be safely entertained; but with such facts as those referred to by Mr. Hoskyns, we ought to combine "practice with science," and by all means to work deeply—thus tasking the restorative powers of nature—while, in the laboratory, the chemist shall pursue, with unremitting assiduity, a course of refined and severe experiments, both as respects analytic products and their practical results in the cultivation of plants. Causes and effects, and conversely, effects and causes, must be made to bear upon each other; and this could be done in ably conducted horticultural and agricultural elementary schools or colleges. Such colleges it is hoped are in progress, but very great watchfulness will be required ere they can become nationally useful. Every plant ought to be analysed, and its juices and secretions ascertained while in the living state: it is not enough to investigate the ashy products of combustion. Each soil should be known, and the effects of saline and other products of individual plants, when added to the several soils, accurately determined. Could we but know—be certain, what any individual plant or plants demand as nutriment, cultivation would be so far conducted upon philosophical principles. May the hint be followed up practically, till a correct theory be established.

ON THE CULTIVATION OF THE SAPOTA AND ZAPOTILLA PLUMS, AS FRUIT TREES.

THE Sapota, Nispero, or Bully Tree is the *Achras Sapota* of Linnæus and other authors, and the *Anona maxima* of Sloane's Jam., vol. ii, p. 172, t. 169, fig. 2. In its native woods it grows to a considerable size, having been known to attain the height of forty-five feet in the mountainous districts of Jamaica; but as a general rule it rarely exceeds thirty feet, and then only forms a broad spreading shrub. Mr. Gibson, who, in 1836, saw it growing in the Calcutta Botanic Garden, says the height varies from twelve to twenty feet. It was introduced to this country from the West Indies in 1731, but has not yet, that we are aware of, fruited in any of our stoves.

DESCRIPTION.—*Plant* a tree-like shrub, growing from twelve to fifty feet high; from every part of which exudes a tenacious, viscid, white juice. *Wood* white; *bark* brown. *Branches* numerous, forming a spreading top. *Leaves* placed in clusters at the extremities of the younger branches, three to four inches long, coriaceous, shining, elliptical-oblong, acute, glabrous, the midrib prominent behind, the lateral nerves numerous, but indistinct: the *petioles* are more or less downy. *Peduncles* from the axils of the terminal leaves, solitary, single-flowered, about an inch long, frequently drooping, rather thick and downy. *Calyx* divided nearly to the base into six rather large, erect, ovate, coriaceous segments, of which the three outer are clothed with dense, ferrugineous hairs, the three inner much paler coloured. *Corolla* of one petal, tubular, rather longer than the calyx, white, cut one-third of the way down into six oblong, obtuse segments: within (alternating with these segments, and nearly equal to them in size and shape,) are six scales, abortive stamens, often notched at the point. Perfect *stamens* six. *Filaments* short, curved upwards. *Anthers* ovate-oblong, opening with a longitudinal fissure at the sides of the cells. *Pistil: Germen* subglobose, densely hairy. *Style* exserted. *Stigma* obtuse, obscurely lobed. *Berry* as large as a moderately-sized apple, often tipped with the persistent *style*, of a dirty brown colour, mottled and spotted with a deeper hue, having at the base the reflexed segments of the calyx; eight to ten-celled, many of the cells frequently abortive. In the inner angle of the cells is a solitary, rather large, laterally compressed, glossy, blackish-brown *seed*, having at the inner angle a long, pale, linear scar; the lower extremity is frequently recurved. *Albumen* white, fleshy, with the flattened embryo in the centre; the *radicle* pointing downwards.—*Sir W. Hooker, in Bot. Mag.*, 3111, 3112.



DESCRIPTION OF THE WOOD-CUT.

a Branch of *Achras Sapota* showing the mode of inflorescence.
b A detached flower; the natural size.
c The fruit in a young state; natural size.
d Section of the full-grown fruit to show the seeds; half the natural size.
e Appearance of the fruit when fully matured; half the natural size.

It belongs to the Natural Order *Sapotaceæ* or *Sapotads* of Lindley's "Vegetable Kingdom;" and is a native of both the West Indies and South America, being extensively cultivated both there and in the East Indies, for the sake of its very agreeable fruit. Two varieties are esteemed, one with elliptical, and the other with globose fruit; the latter, known by the name of *Zappodilla*, is about the size of a Bergamot pear, and the former, called *Sapota*, is much larger. The thick brown rind becomes tough, and somewhat scabrous, when the fruit approaches ripeness; the flesh is then yellow, melting, juicy, and exceedingly sugary and luscious, and is usually eaten with a spoon after the manner of an egg; but, abounding in an acrid milk, it cannot be eaten until fully ripe, or rather, after it begins to decay. When matured, a pleasant fragrance is exhaled. The seeds are bitter, and are sometimes used in medicine, in the form of strengthening emulsions; but if administered too freely, they produce pain, and are attended with danger. The bark is astringent, and often substituted for Cinchona, being known by the name of *Cortex Jamaicensis.* The timber also, although somewhat soft, is much used for various domestic purposes.

In cultivation, the temperature of a warm stove is requisite. During the growing season give a liberal supply of both heat and moisture, and especially keep the atmosphere humid.

If the plants are grown in pots or tubs, a mixture of loam and peat is the best soil for them; but if planted out into a prepared border, a good rich loam without any admixture is preferable.

Propagation is easily effected by making cuttings of the half-ripened wood, and planting them, without removing the leaves, in pots of sand, and placing them under a glass in heat.

THE ALMUG, OR ALGUM TREE OF THE ANCIENTS.

THE Almug or Algum Tree is several times mentioned in Sacred History; and some of the uses are there recorded, to which the wood was at that period applied. The name, however, not occurring in any botanical work, the conjectures of botanists concerning what plant was meant, have been various. Some have thought it identical with the Gum-Arabic Tree (*Acacia vera*), or the Gum Acacia (*Acacia Arabica*); others contended that it resembled the Cypress, and formed an upright woody tree, twenty or thirty feet high, with wrinkled bark, and producing its seeds in the form of small, oblong cones; hence it has been thought that it was either a Cypress, a Juniper, or a Thuja. All agree that the wood was fragrant, close-grained, hard, very durable, and capable of receiving a high polish.

The researches of modern botanists and botanical travellers have, however, as far as the subject will admit of proof, clearly demonstrated that the Almug or Algum of the ancients is neither an Acacia, or any description of pinaceous plant, but one of the plants known to us by the name of Sandal-tree. As this term, however, is applied to several plants of very dissimilar habits, it might be proper to describe these previously to enlarging upon the true one. The first which we will name, is the—

Red Sandal, or Sander's Tree (*Pterocarpus Santalinus*,) Fig. *b*.—This is a native of Ceylon, and various parts of the East Indies, where it forms a lofty tree, seventy feet or more high, with wide spreading branches. *Leaves* consisting of three pinnæ; *leaflets* ovate, obtuse, entire, smooth on the upper surface, downy beneath. *Flowers* yellow, and produced in axillary panicles, bractless. *Calyx* somewhat hispid; divided into five segments. *Corolla* papilionaceous. *Standard* obcordate, erect, reflexed, dentate, striated with vermilion. *Wings* spreading, denticulate, wavy. *Keel* short, oblong, somewhat inflated. *Stamens* diadelphous, nine connected, and one free. *Anthers* white, globular. *Ovary* oblong, compressed, hairy. *Style* curved. *Stigma* obtuse. *Legume* roundish, smooth, compressed, indehiscent, falcated. *Seed* round, compressed.

It became an inhabitant of our stoves, so long ago as 1800, but is not at present found in many collections. The wood is dark-red, veined with black, hard, close-grained, and capable of receiving a high polish; it is also so heavy, that it will sink in water. If immersed in ether or alcohol, it yields a deep red colouring resinous matter, which has been named *Santaline*, and which will form beautiful coloured precipitates, if mixed with metallic solutions. It also yields an inferior kind of *Dragon's Blood*, although a better sort is obtained from *Pterocarpus Draco*; but the chief supply of this gum is at present procured from the *Calamus Draco*, and *verus*, two stove palms, which have been in our collections since 1820.

In cultivation the plant requires the temperature of an ordinary stove, and to be potted in light turfy loam, or a mixture of loam and peat; and propagation is effected by cuttings of the half-ripened wood, planted in pots of sand, without damaging their leaves, and plunged in heat under a glass.

The Peacock Sandal Tree (*Adenanthera pavonina*)—forms a wide spreading tree, rising 100 feet or more in height. The *leaves* are bipinnate; *leaflets* oval, obtuse, glabrous. *Flowers* produced in axillary racemes, hermaphrodite. *Calyx* five-toothed. *Petals* five, lanceolate, acute, valvate in æstivation, yellow. *Stamens* ten. *Anthers* each terminated by a deciduous gland. *Legume* falcate, linear, compressed, membranous, many-celled, swollen. *Seeds* scarlet, with a circular streak in the middle on each side, highly polished. The timber of this tree greatly resembles that of *Pterocarpus Santalinus*, being solid, heavy, close-grained, and of a similar red colour. It also belongs to the Natural Order *Fabaceæ* of Lindley's "Vegetable Kingdom," and is a native of the East Indies, whence it was introduced to this country in 1759. The natives use the powdered leaves in their religious ceremonies; the seeds, which are handsome, and remarkably uniform in size, form an article of food, and are made use of by jewellers as weights.

In the cultivation of this plant, all that is required is a moderate stove heat, a soil composed of turfy loam and peat, good drainage, a liberal supply of water during the season of growth, with proper limits in the period of rest, and at all times a free circulation of air. Cuttings of the young wood taken off at a joint, and planted in pots of sand under a hand-glass in a brisk, moist heat, will grow freely.

The Santoor Sandal Tree (*Sandoricum indicum*); Fig. *c*, forms a spreading tree about forty feet in height; it is a native of the Philippine and Molucca Islands, and various parts of the Indian Continent. The wood is not red, like the two last, but bears a strong resemblance to that of the true Sandal-tree, *Santalum album* : it is, however, altogether destitute of that fine fragrance by which the latter wood is characterised. It is used for various domestic purposes. The *leaves* are pinnated; *leaflets* three, ovate-oblong, entire, downy. *Flowers* yellow, produced in axillary panicles. *Calyx* short, bluntly five-toothed. *Petals* five, linear, acute. *Stamens* ten, forming a tube. *Anthers* inclosed. *Stigmas* five, bifid. *Fruit* a berry, shaped like an apple, fleshy, with an agreeably acid taste. *Nuts* five, ovate, compressed, two-valved. It belongs to the Natural Order *Meliaceæ*, or Meliads of Lindley's "Vegetable Kingdom."

In cultivation the heat of a stove is requisite, and the plants should be potted in a mixture of turfy peat and loam, and increase is readily effected by cuttings of the ripened wood, planted in pots of sand, and plunged under a glass in heat.

Although the above-described Sandal-trees are deservedly esteemed in their native countries, yet the abundant supplies afforded,—the consequent cheapness of the wood,—and the uses to which the timber is applied by the natives, together with the absence of any peculiar aroma; all warrant the conclusion that none of these could be the Almug of the Ancients, which was fragrant, rare, and costly.

The true Indian Sandal-wood is the produce of *Santalum album*, (fig. *a*), and is described by Roxburgh, in "Bot. Mag.," 3235, as a tree-like shrub, growing twenty or thirty feet high; *branched* low down, two-and-a-half to three feet in circumference. *Bark* brownish, scabrous, longitudinally cleft. *Branches* numerous, much divided, spreading, and rising in every direction, forming nearly a spherical head; the young shoots round and smooth. *Leaves* opposite, petioled, oblong, smooth, entire, glaucous below, from one-and-a-half to three inches long. *Petioles* smooth. *Thyrsi of flowers* axillary and terminal. *Pedicels* opposite, the lower pair of each thyrsus generally three-flowered. *Flowers* numerous, small, at first straw-coloured, changing to a deep ferruginous purple, scentless, as are all the external parts of the young growing plant, even when bruised. *Calyx* one-leaved, campanulate; margin four-partite. *Segments* ovate, smooth, the base of the bell only permanent. *Corolla* none, except the calyx or nectarial glands be considered as such. *Nectary* of four roundish, fleshy glands, on the mouth of the calyx, alternate with the segments, and when the flower first expands, it is the most coloured part entire. *Filaments* four, alternate with the nectarial glands, and of the same length, smooth; behind each a tuft of white hairs springs from the disk of the calycine segments, perfectly distinct from the stamens, but of the same length; the extremities of these long white woolly hairs adhere to the back of the small two-lobed anthers. *Germen* half superior, one-celled, with one conical seed at the bottom. *Style* as long as the tube of the calyx. *Stigma* three-nerved, four-lobed.

Berry containing a stone, round, smooth; when ripe, black and succulent, of the size of a cherry, and crowned with the persistent calyx, one-celled. *Nut* solitary, spherical; three small equidistant elevations from the apex run a little way down the sides. *Seed* of the same form as the nut.

It belongs to the Natural Order *Santalaceæ*, grows in various parts of the Continent of India, and is very common on the Malabar coast, in the Great Western Ghauts, between Seringapatam and the sea-ports of Telichery and Calicut. It is recorded in our catalogues as having been introduced to this country in 1804; if so, it was possibly lost again, as, except in the form of dried specimens, it was unknown in our botanical collections until within the last twenty years; subsequently to which time, although the plant is of slow growth, it has found its way into most of the large plant establishments of Great Britain.

The timber possesses a peculiar fragrance, and is highly esteemed; it is prescribed occasionally by the native doctors, being considered cooling and sedative; it is also used as a perfume. For making idols, musical instruments, boxes, cabinets, fans, necklaces, and other fancy articles, it is in general request, not only on account of the fragrance, but because it is not liable to the attacks of beetles, and other timber-eating insects. An oil is obtained by distilling the chips, which is greatly used by the Brahmins, both in their religious ceremonies and at their funerals.

So great is the demand for this wood, that the trees are seldom permitted to stand longer than twenty years; their stems at this age, even under favourable circumstances, rarely exceed eighteen inches in diameter, and if grown in rocky situations, where the timber is always the best, their size is still less. When cut down, more than half the thickness consists of white sap-wood, almost destitute of fragrance; but the close-grained heart-wood, especially that nearest to the root, is yellow, and possesses a rich aroma.

A clever writer in the "Gardeners' Chronicle," for 1843, pages 132 and 333, says, "The wood is divided into three different kinds, according to size and quality. The largest pieces are sent to China, and the middling sized reserved for India. The chips and fragments answer for the Arabian market, as from them the essential oil is distilled.

"A less valuable, but larger sized Sandal wood, is obtained from the more nothern districts of Onore, produced in the low tract which lies between the Ghauts and the sea-shore; though this, like all other Sandal-wood in similar situations, is less fragrant, it becomes a larger tree, and is interesting as being easily accessible; and from Onore having been one of the early ports, might have been known to and obtained by foreign merchants resorting to this coast.

"The Chinese, besides being supplied from India, obtain a still larger quantity of Sandal-wood from Timor, the Feejee and Marquesas Islands. This was long supposed to be yielded by the common Indian species; but M. Gaudichaud considers it a distinct kind, having figured the plant as *Santalum Freycinetianum*. In addition to manufacturing various articles from this wood, they also make use of the fragments by reducing the whole to saw-dust, which being mixed with rice paste, are formed into slender candles, which are burnt as incense in their houses and temples.

" Sandal-wood, though a product of the Malabar coast, became early known in different and distant parts of India, and is mentioned by early Sanscrit writers, under the name of *Chunduna.* The common Indian name is Chundun, which the Arabs converted into Sundal, from which we have Sandal or Sandal-wood.

" Many substances, the produce of India, found their way to northern nations, at very early periods. Among these may be mentioned pepper, ginger, and spikenard. India was, in fact, the chief seat of early commerce, being reached by caravans from the north, or its produce was brought by ships to the Persian Gulf and the Red Sea. Hence we can account not only for the produce, but some of the Indian names of the more remarkable substances reaching the Greeks. Among these Sandal-wood does not appear in ordinary authors. Actuarius mentions it apparently as if it were well known. At a still earlier period, however, that is, at the time of the Periplus of Arrian, who is supposed by Dr. Vincent to have been a merchant of the second century, who visited the coast of Malabar, we find Sandal-wood mentioned, by the name of Xylon Saggalinon, or Sangalinon, easily corrupted, as Dr. Vincent says, from Sandalinon, as an import at Omana, in Gadrosia. Between this and Barugaza, that is Baroach, there has always been a constant intercourse. Maoora, Tundis, and Muziris of the Periplus, are supposed by Dr. Vincent to be the present Onoor, Borela, and Mangalore, the very places from which Sandal-wood is exported, even in the present day, and from which it must have been carried north to Baroach and Omana. And perhaps the reason why it has not been more distinctly mentioned is, that it may have been confounded with another fragrant wood—the Agila, or Aloe-wood (*Aquilaria Agallochum*); as, growing near the coast, and being possessed of such remarkable fragrance, it must have attracted attention as early as any other product of India.

" If we consider also, the deficiency of timber both in Arabia and Egypt, and this combined with the active commerce which seems to have existed at all times in the Red Sea, there must always have been a demand for timber, which could only have been supplied from a variety of sources. In the sacred writings, we find that when Solomon held sway as far as the shores of the Red Sea, in conjunction with Hiram and the Phœnicians, he ' made a navy of ships in Eziongeber, which is beside Elath, on the shore of the Red Sea, in the land of Edom; and they came to Ophir.' 1 Kings, ix. 26. ' And the navy also of Hiram, that brought gold from Ophir, brought in from Ophir great plenty of *Almug* trees, and precious stones.' 1 Kings, x. 11. In the parallel passage of 2 Chronicles, ix. 21, ' The king's ships went to Tarshish, with the servants of Hiram; every three years once came the ships of Tarshish, bringing gold and silver, ivory, and apes, and peacocks.' If with these passages we compare 1 Kings, xxii. 48, and 2 Chronicles, xx. 35, 36, it is evident that the voyage to Ophir was commenced at the head of the Red Sea, and that the ships went to Tarshish as well as to Ophir, in this voyage. Hence there must have been a Tarshish distinct from the Atlantic Tartessus, and perhaps it ought to be sought for, as well as Ophir, on either the African or Asiatic shores, or islands of the Indian Ocean.

"Without attempting to enumerate the various conjectures which have been formed respecting the sites of these places, if they were more than general expressions for rich and distant countries, we may be allowed to infer that, as a great variety of indubitable Indian products were known to the ancients, as Agila or Aloe-wood, spikenard, cinnamon, pepper, and others, there must have been a commerce with India at a very early period, and to it therefore we should look for the cargo of precious stones, ivory, apes, and peacocks, as well as the gold, silver, and Almug or Algum trees which they brought.

"The parts of India which were reached at the earliest times were Crocala, now *Curachee* (at the mouth of the Indus), and Barugaza now *Baroach*, in the Gulph of Cambay. These ports are very little distant from, and can easily communicate with, those on the coast of Malabar, and even with Ceylon: and thus we may account for precious stones, cinnamon of Ceylon, and pepper forming such early articles of commerce. But the merchants who visited the Malabar coast for pepper, must have touched at the very ports in the neighbourhood where sandal-wood grows, and from which it must long have been exported.

"The Ophir and Tarshish of the above passages of Scripture must have been to the southward of the Red Sea, and one of them, at least, in some part of India. From thence the whole of the above cargo might at any time have been easily obtained, and any wood or tree which formed a part of it, and was thought worthy of record, must have possessed some remarkable properties, not common to the trees of the Mediterranean region.

"The Sandal-tree, growing with a straight trunk, though not large, being close-grained, and possessed of such a remarkable and agreeable fragrance, could not fail to attract the attention of merchants visiting the coasts where it grew; and as it was equally well-fitted for making pillars and terraces as for musical instruments, so, perhaps, there is no other tree better entitled than this to be the Almug of the ancients. 'The king made of the Algum trees terraces (pillars, 1 Kings, x. 12) to the king's palace, and harps and psalteries for singers; and there were none such seen before in the land of Judah,' 2 Chronicles, ix. 11. The principal difficulty in the way of the Sandal-tree being the Almug is, that the latter name occurs also in 2 Chronicles, ii. 8, when Solomon asks of Hiram, King of Tyre, to send him 'Cedar-trees, Fir-trees, and Algum-trees, out of Lebanon.' Hence it has been supposed to be a product of that mountain. But Rosenmüller has justly remarked, that in the parallel passage, in 1 Kings, v. 6, 8, 10, there is no mention made of Almug-trees, but only of Cedars and Firs; and he therefore infers, that the addition of Almug-trees in the latter passage, may have been the interpolation of a transcriber."

The writer of the interesting papers from which the above copious extracts have been made, has so far embodied our views, that little need be added; our ideas on the subject are as follows:—

That the Almug, or Algum-tree of the ancients, is neither the Gum-Arabic tree (*Acacia vera*), nor Gum Accacia tree (*Acacia Arabica*); for although the wood of these plants is strong, tough, and durable, and is moreover used for various useful purposes, yet—the trees being common, and natives of Arabia, and their timber not possessing any peculiar properties deserving of so special a notice as is given of that of the Almug-tree—it does not appear probable that either of these species of Acacia is the plant intended.

That although the Almug has been understood by some writers to mean *Lignum Thyina*, the Thya, or Thyine-tree, and by others the *Lignum vitæ*—both evidently pointing to a pinaceous plant, thought to be some species of *Cypress*, *Arbor vitæ*, or *Juniper*, the wood of each of which is almost indestructible—yet the Arabian translators do not appear to have had the same views; they render the passage in 1 Kings, x. 11, thus:— "And the ships of Hiram brought gold from the land of Hind (India) and they carried also coloured wood (this wood is naturally painted of various colours) and very precious jewels. And Solomon put some of that painted wood which was brought to him into the house of the Lord, and in his own house; and with it he adorned them." This rendering of the passage is opposed to the supposition of the Almug being either a *Cypress*, *Arbor vitæ* or *Juniper*, especially if we notice that the *painted* wood is mentioned in connection with gold and precious stones, and is said to be brought by Hiram's fleet from Ophir, or Hind, whereas the Cypress and Juniper are natives of Arabia, and very common.

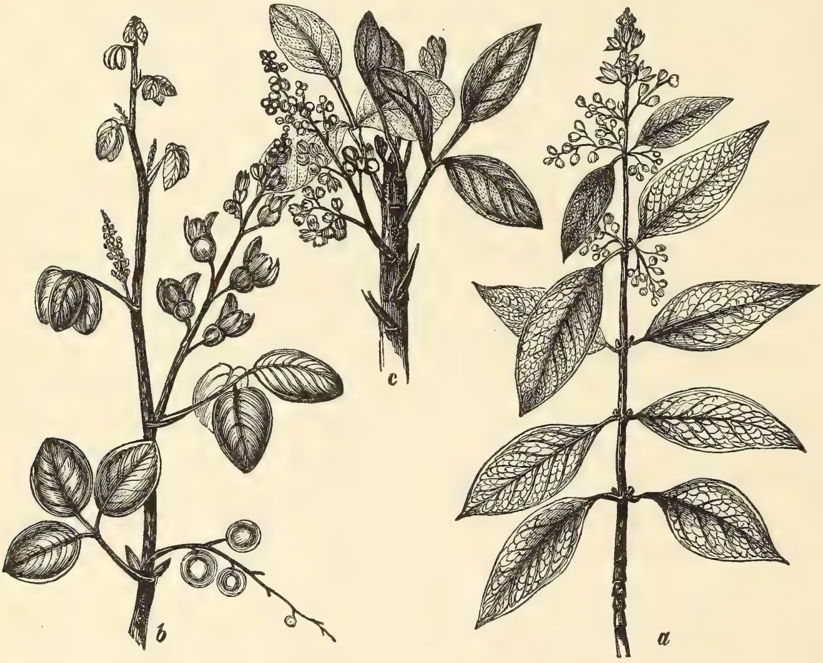
That neither the Red Sandal-tree (*Pterocarpus Santalinus*), the Peacock Sandal-tree (*Adenanthera pavonina*), or the Santoor Sandal-tree (*Sandoricum indicum*), are the plants intended by the term Almug; for although the wood of each is hard, close-grained, and valuable, yet no particular properties are possessed by any, that would entitle them to such especial notice as that recorded of the Almug; and the uses, also, to which the wood is applied by the natives, would by no means favour such a supposition.

Although the subject, with our present limited knowledge, does not admit of full and clear proof, yet perhaps more may be advanced in favour of *Santalum album* being the Almug of the ancients, than can be said of any other known plant.

The wood is close-grained, hard, durable, of a rich yellow, with varied markings, possessing a peculiarly fine fragrance, and is very costly. The uses made of it by the native inhabitants where it grows, and in the countries to which it is exported, are also every way favourable; it is used as a perfume in the same manner as Aloe-wood (*Aquilaria agallochum*) and for making idols, *musical instruments*, ornamental boxes, cabinets, fans, necklaces, and many other fancy articles.

It is generally believed that there were two countries of the name of Ophir; one in Africa, in the land of Sofala, contiguous to Sabia or Sabæa, and not far from the Zambere or Cuama river; where from the remotest antiquity there have been gold and silver mines in abundance, and where the river itself washes down great quantitities of these minerals: the other Ophir is supposed to be the island of Taprobanes or Serendib, now called Ceylon; and it was to this latter country the fleets of Solomon and Hiram went for the rich cargoes of bullion and spices, and that they took in Almug or Sandal-trees from the coast of Malabar and other parts of India on their return.

In cultivation, *Santalum album* requires the ordinary treatment of stove plants, a brisk temperature during the season of growth, with plenty of moisture; and a more moderate one, with partial drought, when in a state of rest; to be potted in a mixture of loam and peat, and propagated by cuttings of the half-ripened wood, planted in sand, and placed under a hand-glass in heat.



DESCRIPTION OF THE WOOD-CUT.

a. Branch of *Santalum album*, or true Almug tree.
b. Branch of *Pterocarpus santalinus*, or Red Sandal or Sanders-tree.
c. Branch of *Sandoricum indicum*, or Santoor Sandal-tree.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE LEADING BOTANICAL PERIODICALS FOR APRIL.

Arthrostemma fragile. Raised from seeds gathered by Mr. Hartweg in the west of Mexico, and received in this country in 1846. It is a stove shrub, growing readily in a mixture of loam, peat, and leaf mould, and easily increased by cuttings. It flowers from June to September, but its blossoms are very fugitive ; they are, however, gay-coloured, (of a deep rosy purple,) and make an agreeable variety, especially as they are associated with a fine deep-green shining foliage.—*Hort. Jour.* 3, 74.

Aristolochia grandiflora (*Pelican-flower*, or*Poison Hog-meat*). Of all known flowers this, if we measure in length, especially from the base to the apex, is the largest, next to the gigantic *Rafflesia ;* it is like that, too, in the mottling and general tone of colour, and, what we could willingly dispense with, its disgusting odour. Still it amply deserves a place in our stoves ; for a large, healthy, well-trained specimen, with its singular blossoms, as remarkable before, as after expansion, presents one of the most striking objects of any vegetable we are acquainted with, and the detestable scent is happily not widely diffused. It was raised from seeds sent from Jamaica by Mr. Purdie, but was first discovered in that island by Patrick Browne, who speaks of it as " the large climbing Birth-wort, with variegated flowers, or the ' Poison Hog-meat,' " and it is there further known by the appropriate name of Pelican-flower. It appears to be identical with *Aristolochia cordiflora* of Mutis' M. S. and A. Gigas of Lindley's Botanical Register, 1842, t. 60. In our stoves, where it is best planted in the ground, though it succeeds tolerably well on a pot-trellis, it flowers during most of the summer months, and in autumn, but the blossom, when once fully expanded, is of short duration.—*Bot. Mag.* t. 4368, 4369.

Gilia pharnaceoides. A slender, purple-stemmed branching plant, minutely downy near the base, but otherwise smooth. The flowers appear at the ends of the straggling branches on very slender but firm stalks about half an inch long, are of a very pale lilac, slightly streaked with a darker tint of the same colour, and measure about half an inch in diameter. It is a hardy Annual, but is very inferior to the *Leptosiphons*, which it most resembles.—*Hort. Jour.* 3, 73.

Goldfussia isophylla (*Equal-leaved Goldfussia*). A species in many respects allied to the well-known *Goldfussia anisophylla*, but at once distinguished, as the name implies, by the pairs of leaves being alike, whereas in the last-mentioned species there is a singular disparity, for while one of each pair is larger and broader than any of *G. isophylla*, the other and opposite one is reduced to a subulate scale. The flowers here, too, though rather smaller are more copious, and the plant being bushy, its numerous blue flowers render it a most desirable inmate of a stove during winter, the season of blossoming. It is a native of the East Indies, and was introduced by Dr. Wallich.—*Bot. Mag.* 4363.

Hugelia lanata. An Annual about nine inches high, quite white with the short wool that covers every part, except the corolla and organs within it. The flowers are a clear light blue, and are placed in close heads, arranged in a corymbose manner. It is not a striking plant, but may be found useful as a novelty among hardy Annuals.—*Hort. Jour.* 3, 74.

Lopimia malacophylla (*Soft leaved Lopimia*). A stove shrub, with rosy-red flowers, sent from New Grenada, by Mr. Purdie, to the Royal Gardens of Kew, where it flowers freely during the winter and spring months, and is far from being unornamental. There is a peculiar aspect in this plant among the *Malvaceæ*, which seems to confirm the correctness of Martin's views in making of it a new genus, although St. Hilaire, in his valuable " Flora Brasiliæ Meridionalis," refers it, and, perhaps, with justice, to *Pavonia.*—*Bot. Mag.* 4365.

Mammillaria clava (*Club-shaped Mammillaria*). A very striking species of *Mammillaria*, remarkable for its columnar, rather than clavate, form, its very prominent mamillæ, and large, glossy, straw-coloured flowers. It was received at the Royal Gardens of Kew under the name here retained, though it does not entirely correspond with the brief character of the plant given by Walpers.—*Bot. Mag.* 4358.

Oncidium tenue (*Thin-bulbed Oncid.*) Received through Mr. Hartweg in February, 1841, from Guatemala. It is remarkable for its exceedingly thin pseudo-bulbs, which although two or three inches long, are not more than one-eighth of an inch thick in the middle, from which they gradually fine away into an edge, which is almost acute. The flowers are not unlike those of Oncidium Suttoni in size and colour: that is to say, yellow, mottled with brown. It is not of much beauty, but adds something to the variety previously known among the species of its own division.—*Hort. Jour.*, 3, 78.

Orothamnus Zeyheri (*Mr. Zeyher's Orothamnus*). We have on several occasions had reason to lament the loss to our collections of many Cape *Proteaceæ*, which were once well known in our gardens: they seem to have died out, and have not been replaced; and we may now express our regret that the present superb species has not yet been introduced alive to our collections. It was discovered lately by Mr. Zeyher in marshy places, on the summits of Hottentots Holland Mountains, flowering in the month of July.—*Bot. Mag.*, 4357.

Oxypetalum Solanoides (*Solanum-like Oxypetalum*). A pretty purple-flowering greenhouse plant, native of Rio de la Plata and South Brazil, with much the habit of *O. cærulean*, Dcsne.; (*Tweediea versicolor, Bot. Mag.*, 3630); but the flowers are not quite so large, nor are they of that bright tint which gives the charm to that favourite shrub. The present species blossoms during the summer months.—*Bot. Mag.*, 4367.

Peperomia pallescens. Presented to the Society by G. U. Skinner, Esq., in April, 1846, from Guatemala. A fleshy-stemmed plant, perfectly destitute of fragrance, with soft, round, fleshy, half-herbaceous branches. The flowers are produced in green drooping tails about six inches long. This stove plant grows freely in a light sandy loam, and is easily increased by cuttings. It flowers in July, is merely curious, not at all ornamental, and only worthy a place in a Botanic Garden.—*Hort. Jour.*, 3, 76.

Pogogyne multiflora (*Many-flowered Pogogyne*). Raised from seed collected by Mr. Hartweg, in "fields about Sonoma," in California. It is a dwarf labiate Annual, emitting a strong smell of horsemint, when bruised, owing to the leaves, which are perfectly smooth, except near the base and when they are young, being copiously marked with small pits connected with cysts of volatile oil. The flowers are of a pale lilac colour, and are arranged in spiked verticillasters at the ends of the shoots. It is hardy, growing freely in any rich soil, and, like most Californian plants of the same kind, may be sown at different seasons. It flowers in August and September if sown in May; and is a pretty dwarf-spreading species, requiring plenty of moisture in summer to keep it in bloom.—*Hort. Jour.*, 3, 78.

Primula Stuartii (*Stuart's Primrose*). This beautiful perennial herbaceous plant is a native of the mountainous parts of India, having been gathered at Gossain Than in Nepal, by Dr. Wallich, and on the Himalayah, at an elevation of 9000 feet, by Royle, who speaks of it as giving a rich yellow glow to those regions. The plant was raised from seeds sent from India by Major Grant during the spring of 1845. It was planted in a north exposed border, in the summer of 1846, in a mixture of loam and peat. It stood the winter of 1846-7 unprotected, and without any artificial covering except its own decayed leaves.—*Bot. Mag.*, 4356.

Sida (Abutilon) integerrima (*Entire-leaved Sida*). An old inhabitant of the stove of the Royal Gardens, but of whose history nothing has been preserved; it is unquestionably a native of New Grenada. Its nearest affinity is perhaps *Sida graveolens*, from which it is abundantly distinguished by its larger size, perfectly entire leaves, different vestiture, differently formed calyx, much greater spread of the flowers, and by the well-defined deep orange spots quite confined to the base of the petals. It flowers in May, and is really one of the handsomest species of the genus.—*Bot. Mag.*, 4360.

Smeathmannia pubescens (*Downy Smeathmannia*). A native of Sierra Leone, and imported by Lord Derby, through Mr. Whitfield. It flowered, probably for the first time in Europe, in the stove in the Royal Gardens of Kew, in February, 1848. It is a more showy species than *S. lævigata*, having larger leaves and larger blossoms, the latter equally destitute of fragrance.—*Bot. Mag.*, 4364.

Spiræa expansa. A hardy shrub, covered in every part with soft short hairs. Its young branches are brownish-green. The flowers are small and pink, in broad terminal corymbose panicles, which are so flat as to form the appearance of a table of flowers. In the wild specimens, the panicles appear to be as much as nine inches across. It grows freely in any good common garden soil, and is easily increased by cuttings of the half-ripened wood in the autumn.—*Hort. Jour.*, 3, 73.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

At the recent exhibitions in the Gardens of the Horticultural Society and the Royal Botanical Society, we noticed the following well grown plants in perfection of bloom :—

Weigela rosea. Messrs. Veitch exhibited a most charming specimen of this Chinese shrub. Its beautiful and graceful habit, the profusion with which it was bloomed, the delicacy and richness of the colour, made it an object of the greatest admiration to the visitors, and certainly proves all that we have hitherto said of its being one of the handsomest shrubs for the lawn or flower-garden that has been introduced. *Franciscea latifolia* was shown, most beautifully studded with large and varied coloured flowers, by Mr. Carson ; a plant worthy more extensive cultivation. *Bouvardia flava,* shown by Mr. Bruce in excellent condition. The plant has a very graceful and pendulous habit, producing at the extremity of its shoots clusters of long, pale-yellow, trumpet-shaped flowers very abundantly, proving itself a plant worthy of extensive cultivation. *Boronia pinnata.*—Among the very numerous specimens of the above, we must particularly point to a fine one shown by Messrs. Henderson ; large, compact, and most profusely covered with pink blossoms, exhibiting great skill and attention in the cultivator. *Æschynanthus Javanicus,* a fine specimen shown by Mr. Jack, in good flower, seems to be but a very little move from *Æ. pulcher* and *Æ. Boschianus,* especially in the flower, while the foliage is about midway betwixt those species ; most probably a hybrid of nature's formation.

Chorozema Henchmanni an immense specimen ; *Davesia latifolia, Podolobium staurophyllum,* admirably managed, and *Eriostemon myoporoides,* were exhibited by Messrs. Frazer, nurserymen, Lea Bridge Road. *Leschenaultia biloba* has been produced remarkably fine by the following cultivators : Messrs. Carson, Kyle, Bruce, Jack, and several others. *Acacia pulchella,* a very handsome and compact specimen by Mr. Taylor, gardener to T. Coster Esq. *Tetratheca verticillata* was exhibited in most profuse condition of bloom by Messrs. Henderson, Pine-apple Place Nursery, Edgeware Road, and by several other cultivators, proving it to be a first-rate plant for specimen cultivation. Among the numerous varieties of hybrid Azaleas, we noticed the following as being the best, and worthy a place in every Collection ; *A. Feilder's, white,* large and pure in colour, good texture, and a profuse bloomer ; *A. macrantha purpurea,* a fine bold flower richly spotted with crimson, shown by Mr. Donald, gardener to Mrs. Lawrence, Ealing Park ; *A præstans,* a rich rosy carmine, very brilliant in colour, shown by Mr. Carson ; *A. alba maculata,* a fine-shaped flower, large, spotted and flaked with rosy lilac, novel and handsome ; *A. alba exquisita,* a flower of the purest white, without mark or spot, rather long, petals well rounded, and of good substance ; *A. violacea elegans,* very fine and well-shaped flower, a bright rosy lilac colour, shown by Mr. Green. Messrs. Standish and Noble, nurserymen, Bagshot, exhibited a semi-double *Azalea* of some considerable beauty, a bright rose colour, outer petals broad and round, with the inner petals much larger than any double variety yet produced ; no doubt it will become a favourite, being large, as well as a good bloomer ; they likewise had a large collection of seedling Ghent Azaleas profusely in bloom, exhibiting a great variety of tints, varying from the brightest scarlet and orange to pale yellow. Messrs. Frazer had a fine *A. alba magna,* its size and purity of colour being a very great recommendation. Among the numerous collections of Pelargoniums, one exhibitedby Mr. Gaines of Battersea, consisting of Fancy kinds, was well deserving of especial notice, from their neatness and very great profusion of blossom, showing them as likely to become most useful for bedding, &c., intermixed with other varieties. Mr. G. likewise exhibited a new seedling, called *Ne Plus Ultra,* a very beautiful variety, and an improvement upon the one raised by him called *Anais,* the rich crimson being more equally distributed throughout the flower, leaving a deep and regular margin of white.

Among the various collections of Orchidaceous plants, the following were very superior in rarity and cultivation :—*Epidendrum crassifolium,* a most remarkable specimen, with upwards of twenty large heads of bloom. *Camarotis purpurea* and *Dendrobium moniliforme,* most charmingly flowered by Mr. Williams, gardener to — Walner, Esq.; *Dendrobium formosum* with ten or twelve of its large white flowers fully expanded ; *Phalænopsis grandiflora* with five scapes of bloom. *Vanda tricolor* and several other species were exhibited very finely in flower by Messrs. Veitch, Exeter. *Bletia campanulata,* with three scapes of large rich purple blossoms, *Vanda insignis, Chrysis bractescens,* fine, *Cymbidium eburneum, Epidendrum bicornutum* and *tibicinis, Dendrobium Devonianum,* very handsome, *D. Dalhousieanum, D. densiflorum,* seventeen spikes fully expanded, *Odontoglossum citrosmum,* seven spikes in good condition, and *Paphinia cristata,* were exhibited by

Mr. Mylam, gardener to S. Rucker, Esq., Wandsworth; *Acineta Humboldti*, an immense specimen exhibited by Mr. Carson, with seven scapes of bloom. *Tricohpilia tortilis* was shown by Mr. Plant, gardener to H. E. Schroder, Esq., in great beauty; the plant though small had upwards of forty-five flowers fully expanded, hanging over the edge of the pot, and interspersed among the foliage; an excellent specimen of good cultivation. *Dendrobium pulchellum* was another charming specimen of good cultivation, the plant literally buried by its gaily-coloured flowers in such profusion as almost to defy description; *Dendrobium nobile*, a more superb plant, both for the size, profusion, and rich colour of its flowers, we may confidently state has never been surpassed. These were exhibited by Mr. Green, gardener to Sir E. Antrobus, Cheam; the latter plant, Mr. G. informs us, he treats as a greenhouse plant while making its growth; afterwards, to assist the development of the flower, but only for a short period, he places it in a cucumber pit, and certainly the healthy appearance of the specimen clearly shows that it has received a treatment most suitable. *Dendrobium fimbriatum*, an excellent specimen, was shown by Mr. Jack, gardener to G. Lorraine, Esq., Carshalton, flowering most abundantly; we counted upwards of seventy racemes upon it. A plant such as this, its graceful and pendant habit, accompanied with the large mass of bright golden blossoms, is very rarely seen or surpassed.

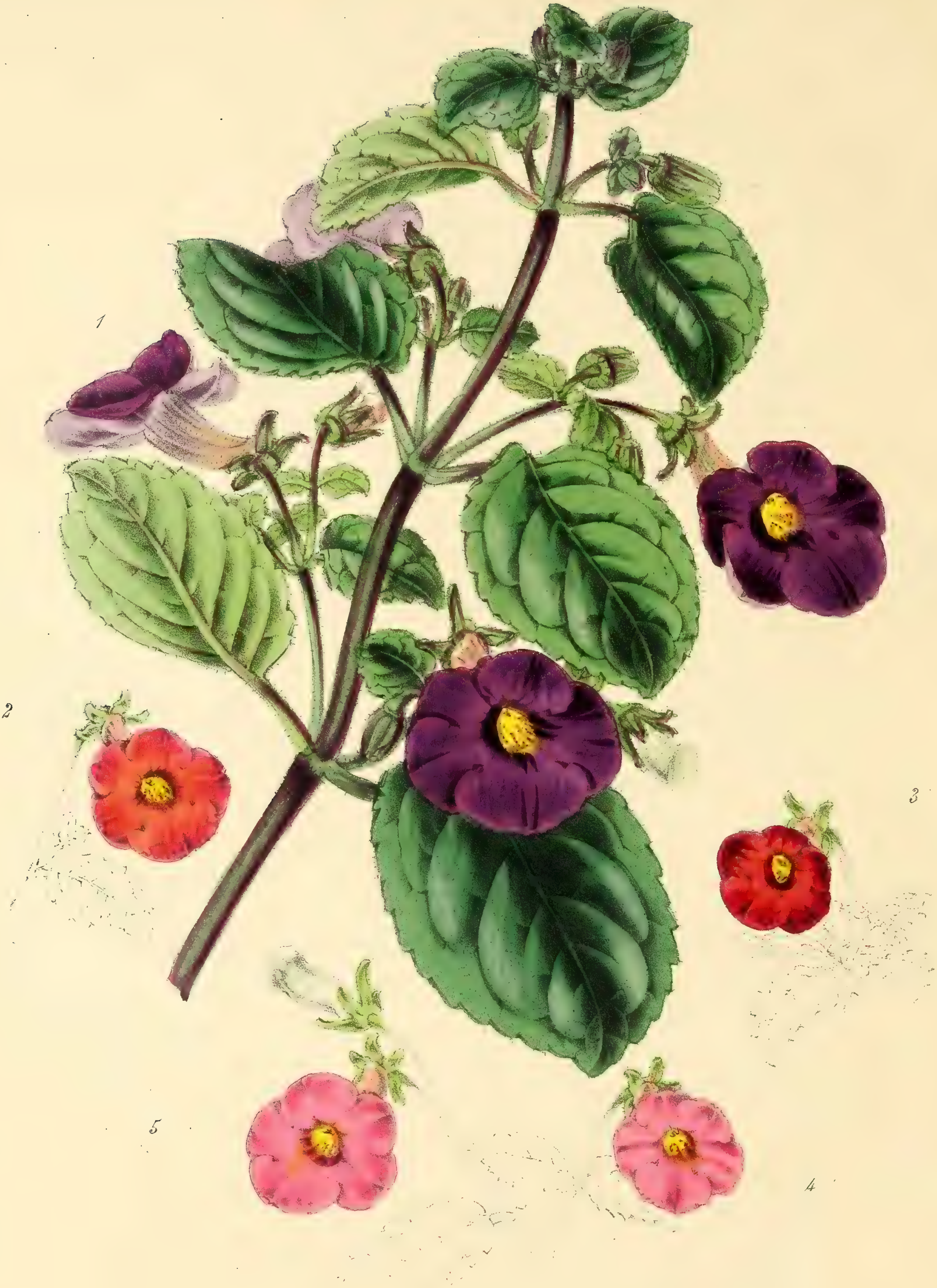
OPERATIONS FOR JUNE.

This month is one of the most cheerful and gay in the whole year; almost every part of vegetable nature being now in the most vigorous growth. The business, however, of a cultivator is chiefly routine. In plant structures, especially those where a strong heat is kept up, as in the stove and Orchid house, insects will be very numerous, and must be closely looked after, or their depredations will entirely prevent success. Amongst Orchids, *Stanhopeas* and other kinds with similar habits will now be coming into flower; take care the buds are not broken against the sides of the pots or baskets. *Dendrobiums*, also, of several sorts will now make a fine show. All Orchids attached to blocks of wood must be often watered, and are better for being occasionally plunged into a cistern of water, of the same temperature as the house. A free circulation of air is also of great importance at this season of the year, which should always be given in the morning; syringe freely to prevent aridity; keep the walls and floors wet, and always close with plenty of solar heat. If the sun be very bright, as was the case for some time past, until the 17th of May, stretch a screen over the roof, which might also be regularly wetted with the syringe. Such Orchids as naturally grow in cool and mountainous parts of the tropics, as *Lælias*, *Cattleyas*, and some others, which were noticed in last month's "Operations," should be removed to a cooler place without delay; a common vinery will answer very well. *Stove plants* require treating liberally with heat and moisture, as recommended last month. Give good shifts to such as require it, and be sure to give plenty of drainage. When plants for winter-flowering have formed their wood, remove them to a cooler place to ripen and harden, that they may bear exciting, in the dark weather of winter, without injury.

There is scarcely a handsomer plant for winter-blooming than *Euphorbia jacquiniflora;* it should be potted in a very sandy peat, containing plenty of fibre, and the pot filled with one-third of broken crocks. Whilst in a state of growth, very weak and clear liquid manure should be used.

In the greenhouse and conservatory, specimen plants of *Fuchsia*, *Pelargonium*, and other fine-flowering species, may be introduced, to supply the places of others as they go out of bloom. *Cinerarias*, *Pelargoniums*, and some others, should be planted in the flower-borders. *Chorizemas*, *Corræas*, *Epacrises*, and other plants with similar habits, should now be pushed into vigorous growth, and let all the strong shoots be stopped, to render the plants bushy. Syringe them whilst growing, every fine day, close the house early to increase the heat. Cactaceous plants, which have flowered freely, should be placed in a moist and warm temperature, to encourage them to grow. Camellia stocks may also now be safely grafted; select the young shoots for the purpose, as ripe as possible. Make cuttings of everything necessary. *Habrothamnus fasciculatus* and *corymbosus*, which have flowered in pots or tubs, may now be turned out of doors, as recommended in *Mag. Bot.*, v. 14, p. 113.

In the open flower-garden, the early part of the month will be occupied with filling up the borders and beds with half-hardy plants intended for autumn-flowering; and after this in trimming, watering, keeping clean, and much other business which will not now admit of the least neglect.



S. Holden del & Lith

Achimenes' seedling var.

1 venusta. 2 superba. 3 grandiflora ignea.
4 intermedia. 5 rosea major.

ACHIMENES VENUSTA.

(Lovely Achimenes.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERACEÆ.
(Gesner-Worts, *Veg. King.*)

Generic Character.—*Calyx* with its tube adnate to the ovary; limb five-parted; lobes lanceolate. *Corolla* tubularly funnel-shaped, often swollen at the base; limb five-cleft; lobes sub-equal, sub-rotund. *Stamens* four, didynamous. *Anthers* not cohering. Rudiments of the fifth *stamen* situated below the base of the corolla. *Nectary* glandulose in a small ring. *Style* slightly thickened towards the stigma, oblique or with two separate lobes. *Capsule* nearly two-celled, two-valved; placentas parietal, subsessile.

GARDEN HYBRIDS.

I. Achimenes venusta, *Lovely Achimenes.*—The subject of our present plate is a handsome kind, apparently raised betwixt *A. roseum* and *A. patens*, and partakes in a medium way of the habits of both the parents. The flowers also, both in size and colour, are intermediate, being of an intense purplish lilac, with a bright yellow throat. It is a prolific bloomer, with small leaves, of a dark green, tinged beneath with reddish purple, which latter colour also extends to the calyx, stems, and peduncles. Cultivators will no doubt highly esteem it.

II. Achimenes coccinea intermedia, *Intermediate Scarlet Achimenes*, greatly resembles *A. rosea*, which is evidently one of its parents; the flowers, however, are smaller, and of a brighter scarlet.

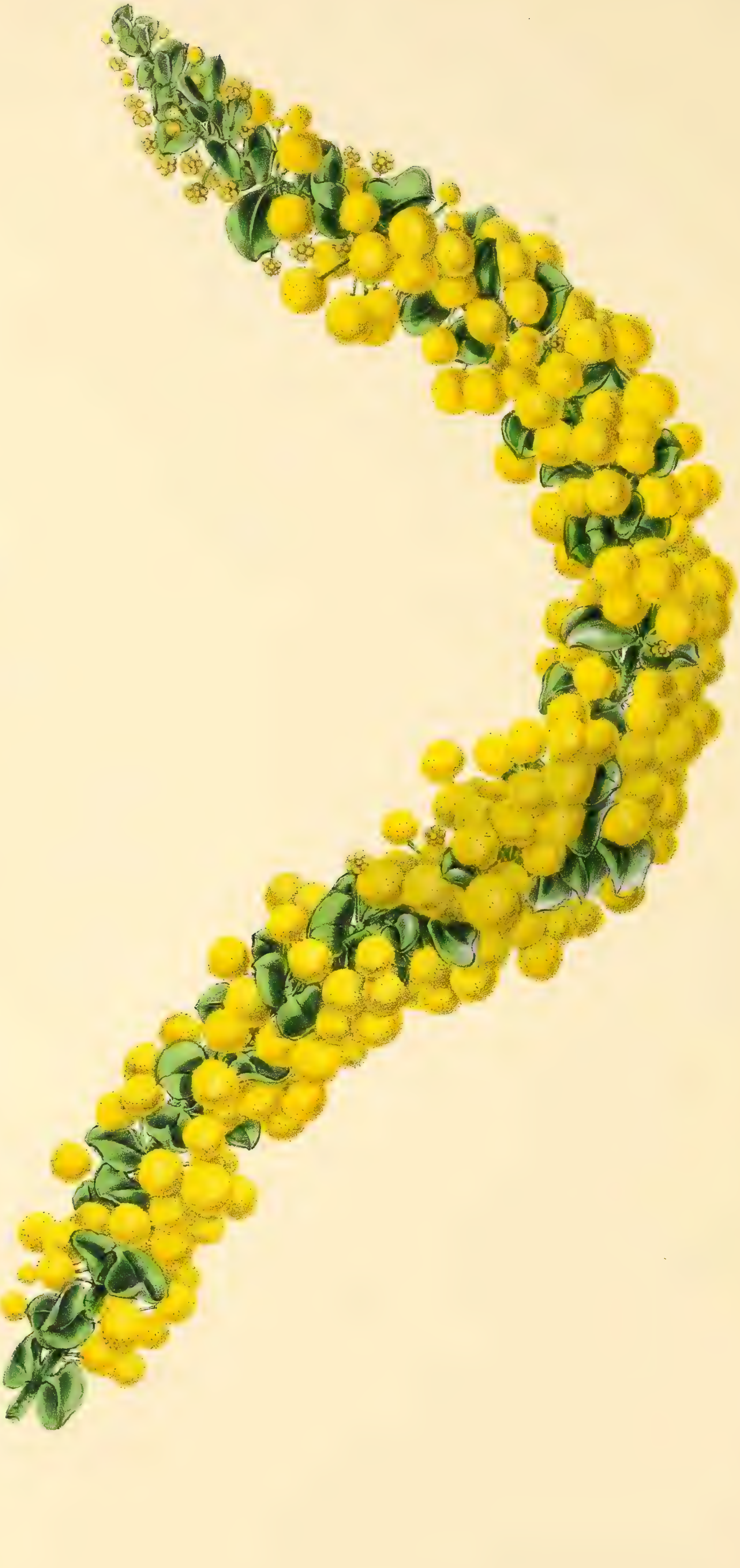
III. Achimenes coccinea superba, *Superb Scarlet Achimenes.*—This kind bears flowers of a fine deep scarlet, with slight marks down the centre of the lobes of the corolla, and are somewhat larger than those of *A. coccinea.*

IV. Achimenes coccinea grandiflora ignea, the *Fiery Large-flowered Achimenes.*—The flowers of this kind are of a fine crimson scarlet, very rich and brilliant, of a round form, with compact clean edges; it is a free bloomer, and altogether very fine. The habits, like those of Nos. 2 and 3, resemble *A. coccinea.*

For the opportunity of figuring the above four hybrids, we are indebted to the kindness of Messrs. Backhouse, of York, in whose nursery they were raised from seeds, and flowered profusely in August, 1847, when our drawing was made.

The cultivation is the same in every respect as that of *A. patens*, *Mag. Bot.*, v. xiii., t. 197.

The derivation of the generic name is unknown.



S.Holden, del & Lith.

Acacia rotundifolia.

ACÁCIA ROTUNDIFOLIA.

(Round-leaved Acacia.)

Class.
POLYGAMIA.

Order.
MONŒCIA.

Natural Order.
FABÀCEÆ, *Veg. King.*

Generic Character.—*Calyx* four or five-toothed. *Petals* four or five, sometimes free, and sometimes joined together into a four or five-cleft corolla. *Stamens* variable in number, from 10 to 200 in each flower. *Legume* continuous, dry, two-valved. *Don's Syst.*

Specific Character.—*Plant* an evergreen shrub, three or four feet high. *Branches* slender, straggling, angled, slightly downy. *Phyllodia* on very short petioles, about half-an-inch long, rotundate, but the two halves unequal, waved, very obtuse, or rather retuse, mucronate, slightly pubescent, the margin in the adult ones only obscurely thickened, ciliated, and at the upper edge below the middle, furnished with a minute gland, deep but not glaucous green. *Costa* excentral, tolerably distinct, and from it diverge a few nerves in a pinnated manner. *Stipules* very minute, resembling small, acute, reflexed scales, deciduous. *Heads of flowers* globose, solitary, or in racemes of two to four or five heads, the *peduncle* always longer than the leaves, and the *pedicels* longer than the capitula. *Calyx* of five deep, linear segments. *Corolla* of five oblongo-ovate *petals*, nearly twice as long as the calyx. *Stamens* numerous, more than twice as long as the corolla.—*Hooker*, in *Bot. Mag.* 4041.

Authorities and Synonymes.—Acacia, *Neck. Elem.*, 1297; *Willd. Spec.*, iv. p. 1049; *De Candolle's Prod.*, ii. p. 448. Acacia rotundifolia, *Sir W. Hooker*, in *Bot. Mag.*, t. 4041.

For our drawing of this very gay species of Acacia we are indebted to Messrs. Low and Co., of Clapton, in whose nursery it flowered in great profusion during last February and March.

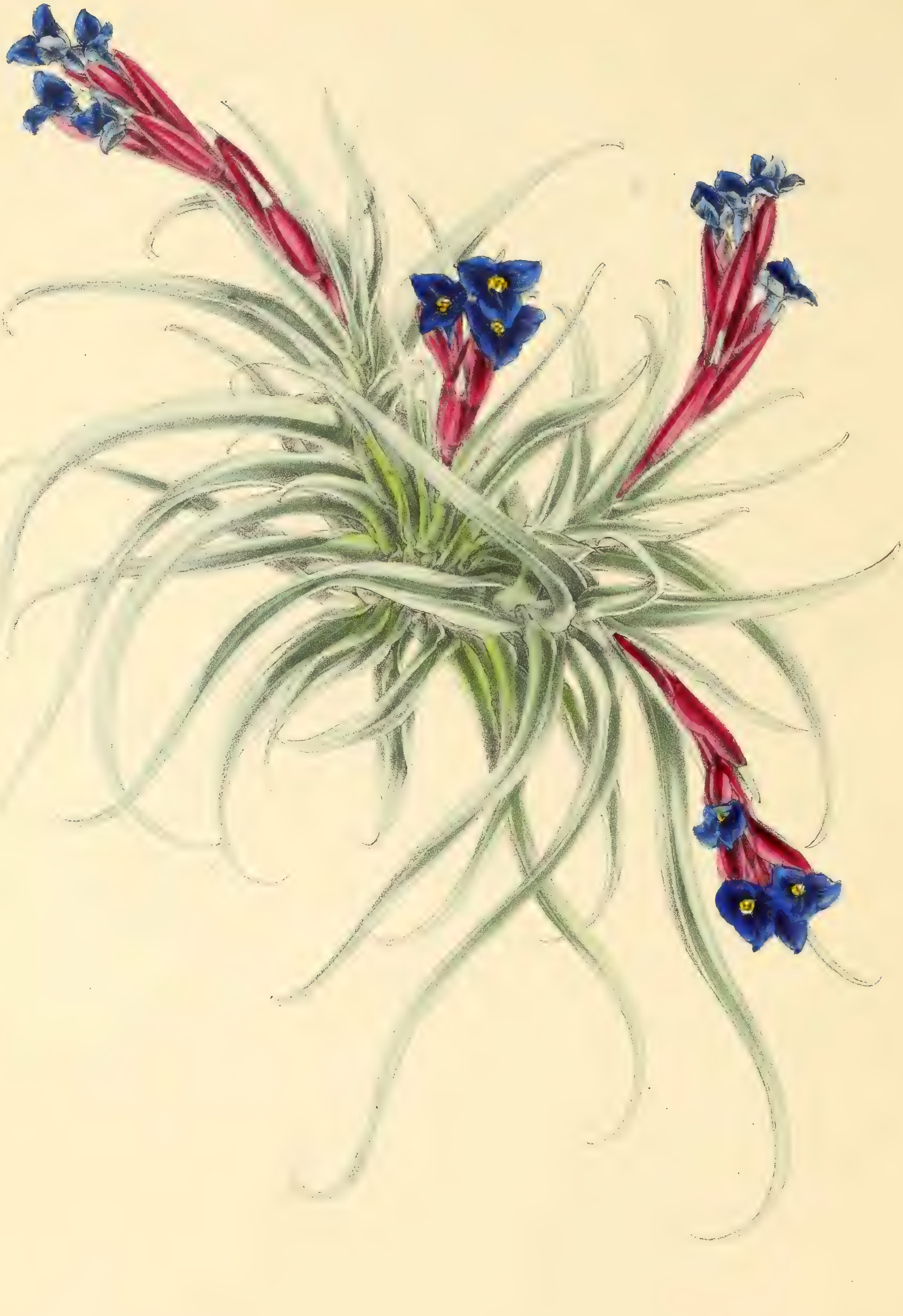
It is a native of New Holland, where it is said to form a broad-spreading loose shrub, about four feet in height, and as much in diameter, clothing the vast tracts, where it grows with a beauty more easily conceived than described. It was introduced in 1842, and flowered for the first time in this country in the greenhouse at the Royal Botanic Gardens, and was figured and described, by Sir W. Hooker, in the Botanical Magazine, t. 4041.

Its growth is by no means neat, the branches are so loose and straggling; but if trained tastefully to a stick or trellice, with the upper parts of the shoots at liberty, they will hang very gracefully, and when covered with the golden globular heads of inflorescence, the plant will be an object of great admiration.

Nearly three hundred species of this extensive genus have already been introduced, about two-thirds of which are natives of New Holland; generally speaking, they are amongst the most ornamental greenhouse plants we possess, and are especially valuable on account of their flowering during some of the most dreary months of the year, from January to April. They are also pretty hardy, and are of very easy management.

Like the other species of Acacia it should be potted in a soil composed of two-thirds sandy loam, and one-third fibrous sandy peat. A good drainage is important, with a liberal supply of water when the plant is in bloom, and during the time it is forming its wood. Increase is effected easily by cuttings of the half-ripened wood, planted in pots of sand, covered with a glass, and placed in a gentle heat.

The generic name is derived from *ake*, a point, or *akazo*, to sharpen; many of the species having thorns or prickles.



S. Holden del & Lith.

Tillandsia stricta.

TILLÁNDSIA STRÍCTA.

(Straight Tillandsia.)

Class.
HEXANDRIA.

Order.
MONOGYNIA.

Natural Order.
BROMELIÀCEÆ.
(Bromel-Worts, *Veg. King.*)

Generic Character.—*Calyx* trifid, persistent, convolute. *Corolla* longer than the calyx, tripartite, or tubulose and trifid. *Stamens* inserted in the tube of the corolla. *Capsule* obtuse, trigonous, three-celled, many-seeded. *Seeds* comose.

Specific Character.—*Plant* an epiphyte. *Leaves* recurved, covered with a kind of frost-like scale, lanceolate, acuminate, convolute, longer than the scape. *Scape* erect, less scaly. *Flowers* bright deep blue, with large, ventricose, oblong, acute bracteæ, of which the lowermost are cuspidate. *Petals* ovate, acute, and spreading at the end, as long as the bracteæ.—*Lindl., Bot. Reg.*, 1338.

Authorities and Synonymes.—Tillandsia, *Linnæus.* T. stricta, *Spreng. Syst.*, ii. 24; *Bot. Mag.*, 1529; *Bot. Reg.*, 1338.

Although the subject of our present plate is a very old inhabitant of our stoves, being introduced by Lady Neal so long ago as 1810, yet as a Bromel-wort it would be difficult to find a more beautiful little plant; indeed it is quite a gem, and we are induced to bring it before our readers in the hopes that this notice of its merits may lead to its becoming more extensively cultivated; as at present, with a few exceptions, it is almost unknown.

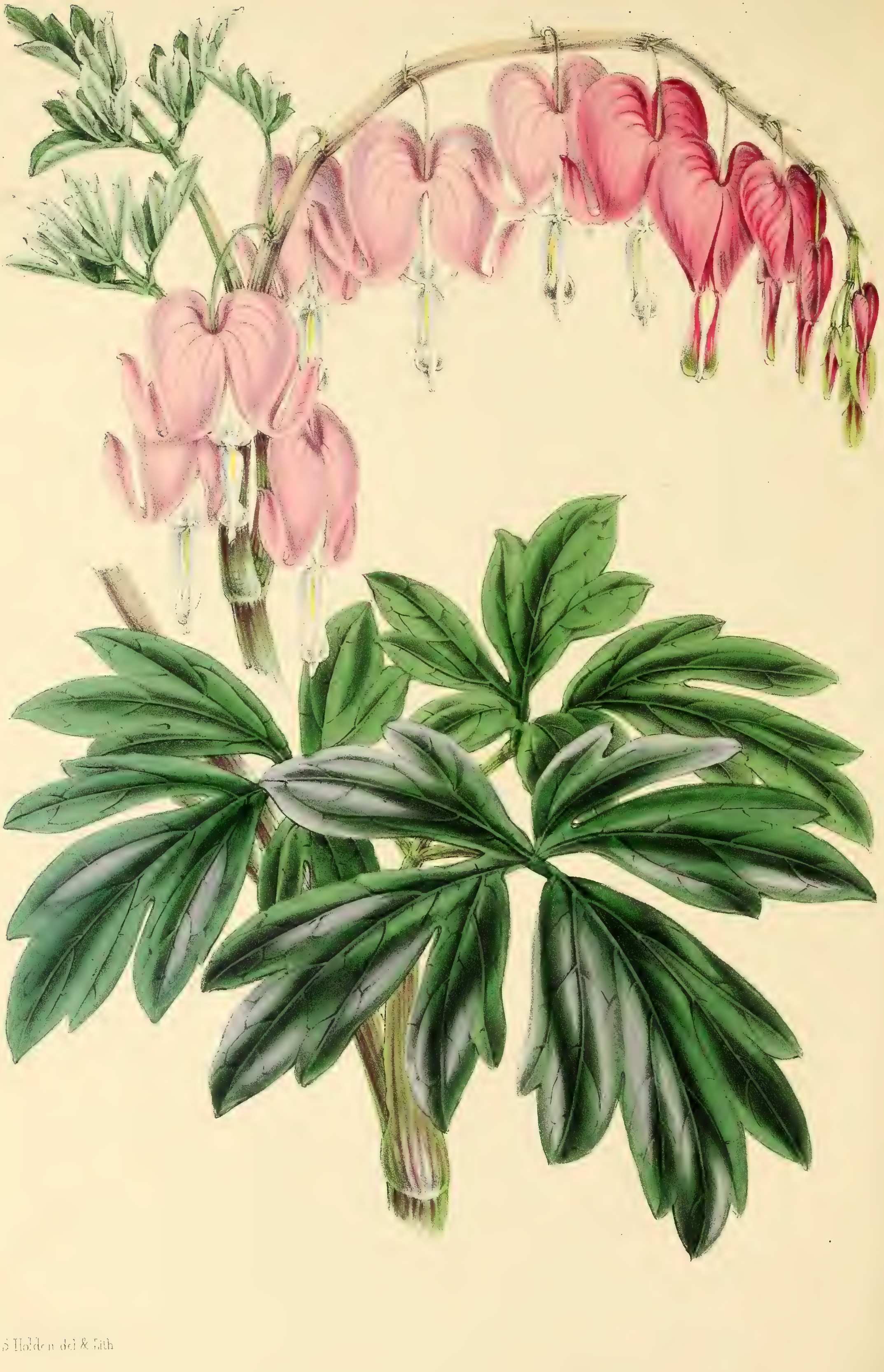
It is a native of Buenos Ayres and the Brazils; in the latter country it was discovered by Dr. Solander, growing as an epiphyte on the branches of trees near Rio Janeiro. Subsequent botanical travellers have also met with it in various other localities, and the importations have been frequent.

Our drawing of this charming little species was made from a specimen which flowered in the stove of Messrs. Henderson, Pine-apple Place, Edgware Road. The plant was very small, had a ball-like appearance, with its richly-coloured flowers bristling from every side, and was growing suspended from the rafter. The specimen is but an inch-and-a-half long before the flower-scape appears, and this does not extend three inches farther, and is of the richest crimson, both stem and bracts, and the tiny flowers are of a fine purple blue.

Attached to a block of wood, with a little moss to cover the roots, and hung from the roof of the Orchid-house, with the same general treatment as given to *Cattleyas*, and other Orchids of similar habits, it will grow and flower freely, and may be easily increased by suckers.

In the "Botanical Register," t. 1338, Dr. Lindley describes the mode of treating this plant pursued by Peter Kendal, Esq., in 1830, when the culture of epiphytes was much less understood than it is at present. "In June he took it out of the stove, and suspended it from a wall in the open air, where it was left without water, attention, or protection, till the succeeding October; it then appeared withered, discoloured, and in appearance half-dead; as soon, however, as it was again submitted to heat and moisture, it recovered rapidly, commenced a new and vigorous growth, and in the course of a few weeks lost all trace of its previous sufferings, assuming a rich, healthy vegetation. After throwing out suckers from each side, it shoots up its spikes of bright blue flowers, which begin to open in March, and endure to the end of April: when the period for a cessation of growth draws near, its parts harden, its flowers fall away, and by June it is ready again to undergo the same treatment as before.

The genus is named in honour of Elias Tillands, Professor of Physic at Abo.



S. Holden del & Lith

Dielytra spectabilis.

DIELYTRA SPECTÁBILIS.

(Remarkable Dielytra.)

Class.
DIADELPHIA.

Order.
HEXANDRIA.

Natural Order.
FUMARIÀCEÆ.
(Fume-Worts, *Veg. King.*)

Generic Character.—*Petals* four, the two exterior ones equally spurred or gibbous at the base. *Stamens* six, altogether free, or approximating into two bundles, or joined at the top, and free at the base. *Capsules* two-valved, many-seeded.

Specific Character.—*Plant* an herbaceous perennial. *Stems* growing from a foot to a foot and a half high, leafy. *Leaves* palmately trifid; segments obovate-cuneate, cut. *Pedicels* moderately long, fleshy, tinged with purple. *Racemes* axillary, four to six inches long, each containing about twenty flowers. *Petals* four; two outer ones crimson purple; each with a very blunt, ventricose, short, sheath-like spur at the base; two inner ones narrower and projecting far beyond the revolute points of the outer ones; white with a purple tip.

Authorities and Synonymes.—Dielytra spectabilis, *De Cand. Prod.*, i. 126; Fumaria spectabilis, *Linn. Amœnitates*, vii. 457, t. 7; Capnorchis spectabilis, *Börck. in Rom. Arch.*, i. 2, 46; Corydalis spectabilis, *Pers.*

Our drawing of this very desirable herbaceous plant was made from a specimen which flowered in the nursery of Messrs. Knight and Perry, King's Road, Chelsea, in February last. It was first introduced from the north of China to the London Horticultural Society, by Mr. Fortune, in 1846, who found it growing in the gardens of the Mandarins, and by them highly esteemed. It fully bears out the character given of it in the "Journal of the Horticultural Society," where it is stated to be "beyond all comparison the handsomest of the natural order of Fumeworts."

"It was first made known to Europeans by the Russo-Siberian, De Karamyschew, who, studying at Upsal, communicated it to Linnæus. It does not, however, appear to have been seen alive until Mr. Fortune found it cultivated by the Chinese, and brought it home with him."

"It is one of those plants of which the Chinese Mandarins in the north of China are so fond, and which they cultivate with so much pride in their little fairy gardens. Mr. Fortune found it first in the grotto garden on the Island of Chusan growing amongst the artificial rocks, near the beautiful *Weigela rosea.* Its Chinese name is *Hong-pak Moutan Wha*, or the Red and White Moutan Flower.

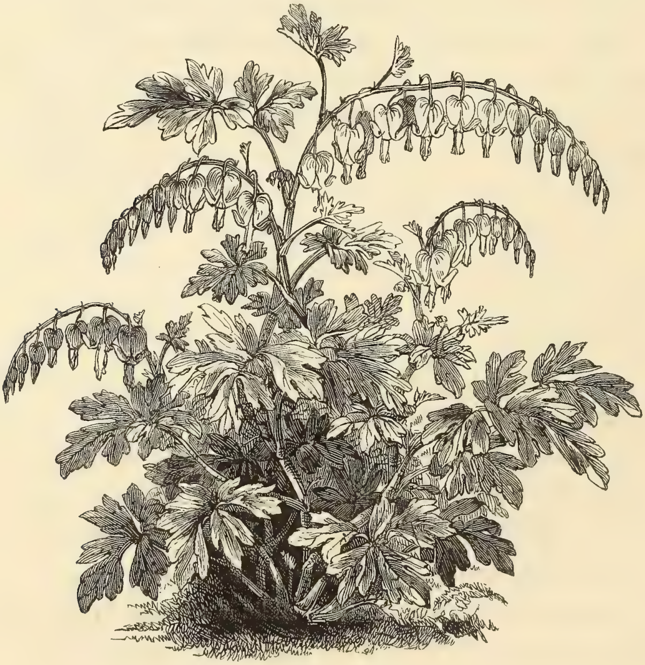
"As a pot-plant for rooms it is extremely graceful, and remains for a long time in flower. Its habits are the same as the well-known *Dielytra* (Fumaria) *formosa*, a plant common in all gardens where showy herbaceous plants are grown. The stems die down in autumn, and the roots remain in a dormant state until the following spring, when the plant again appears above the ground, and flowers in the months of May and June."

Being a native of Siberia and the Northern Provinces of China, there is little doubt but it will prove perfectly hardy, although it is yet too scarce and expensive a plant to allow of a fair trial being given.

A light rich soil, good drainage, and a sheltered situation are all that it requires. It will prove a most useful plant for early forcing, as it needs only a moderate amount of heat to excite it to bloom; the specimen from which we made our drawing, only having been introduced to the forcing-house three weeks, became most beautifully in flower. Increase is effected both by division of the roots and by cuttings. The best time for the former is when the plants first begin to grow in spring, and the cuttings should be made from the young shoots, which when they become sufficiently hardened should be cut in lengths and planted under a handglass in a gentle bottom heat.

The generic name is derived from *dis*, double, and *elytron*, a sheath; alluding to the two sheath-like spurs at the base of the flower.

The annexed woodcut strikingly exhibits the habit and general appearance of the plant.



THEORY OF THE DEW.

Every one knows, or believes that he knows, what the Dew is; but we believe, if the phenomena which attend it were strictly and impartially investigated, candour would require the admission that real knowledge is very superficial indeed! Persons are not prone to inquire:—to do so requires trouble, and it is more facile to admit, than to investigate; hence it has happened that Dr. Wells, a native of Charlestown, in South Carolina, (but who came to England in 1775, and studied as a physician,) is regarded as an authority—one from whose "Theory of the Dew" it is almost heretical to appeal. It is far from our desire to disparage the doctrine, or its observant writer. Dr. Wells has advanced many unquestionable truths, which it is our duty to notice, in order to induce a spirit of research and enquiry among our horticultural amateurs. Loudon has done the same thing above twenty years ago, in the "Encyclopedia of Gardening," and at this time the subject has been revived by another author, whose opinion shall, in the course of this enquiry, be duly noticed.

In 1788, Mr. Wilson, of Glasgow, addressed a paper to the Royal Society of Edinburgh, in which he suggested that "cold is occasioned by the formation of dew." Mr. Six, the inventor of the self-registering thermometer, which bears his name, observed "that the production of dew is accompanied with cold on the surface of the ground greater than in the atmosphere a few feet above it; the differences being frequently five, ten, or more degrees of Fahrenheit." This is true; and to that difference we must ascribe some of the irregularities of our meteorological reports, because—let us select the aspect how one may, even if three thermometers are suspended above the ground,—and admitting that they agree to a fraction, other three instruments will all differ; if one lie on the grass, another be suspended against a pole in the shade, and the third be attached to a wall, where a reflected sun heat shall in any degree strike it. It is never fair to let the instrument lie on the grass, unless it be with the express object to determine the lowest degree upon the herbage during the night or early morning. Suspended thermometers always present returns the most equable: those which are otherwise situated exhibit the strongest contrasts.

The Dew, whatever be the prime, actuating cause of its deposition, must depend upon the presence of watery vapour in the atmosphere; and this being understood, we may now approach the theory of Dr. Wells.

"During nights which are equally clear and calm, Dew often appears in unequal quantities, even after due allowance is made for their different lengths: thus it is more abundant shortly after rain than during a long season of dry weather. In particular localities it is generally more abundant during southerly and westerly winds than when they blow from the north and east. To the greater or less quantity of moisture in the atmosphere at the time of dewing—subject to the immediately exciting cause—is its copiousness or deficiency to be referred.

" 1. Dew is commonly more plentiful in spring and autumn than in summer; the reason is, that a greater difference is generally found between the temperatures of the day and the night in the former seasons of the year than in the latter. In spring this circumstance is often prevented from having a considerable effect by the opposite influence of northerly and easterly winds; but during still and serene nights in autumn, Dew is always highly abundant."

Before we proceed in quotation, and while admitting the abstract truth of the above facts, we put the question, why should these things be so? Why should the east and north winds, colder as they usually are than those winds which blow between south and west, prevent the deposition of dew? Doctor Wells deals with facts, and refers his phenomena to radiation. He appears to have lost sight of, or rather, never to have entertained the slightest notion of electricity—its attractive and repulsive agency. The reader is requested to bear this in mind. Causes there are, and must be; and to the study of those we shall hereafter solicit the reader's attention.

" 2. Dew is always very copious on those clear and calm nights which are followed by misty or foggy mornings: the turbidness of the air in the morning shows that it must have contained, during the preceding night, a considerable quantity of moisture.

" 3. I have observed Dew to be unusually plentiful on a clear morning which had succeeded a cloudy night. For the air having in the course of the night lost little or no moisture, was in the morning more charged with watery vapour than it would have been if the night had also been clear.

" 4. Heat of the atmosphere, if other circumstances are favourable, occasions a great formation of dew. I always found, when the clearness and stillness of the atmosphere were the same, that more Dew was formed between midnight and sunrise than between sunset and midnight, though the positive quantity of moisture in the air must have been less in the former than in the latter time, in consequence of a previous precipitation of part of it. The reason, no doubt, is the cold of the atmosphere being greater in the latter than in the early part of the night.

" 5. Dew forms in very different quantities on different substances under the same circumstances: thus, on metals it is sparingly deposited; on glass, it forms abundantly, as it does also on straw, grass, cloth, paper, and other similar substances. Now, as the metals radiate heat imperfectly, and the other bodies mentioned in a much greater degree, they become consequently colder than the metals, and hence condense more vapour into Dew." Here, again, a remark is called for. *Metals reflect* and conduct more freely than they *radiate*, and also far more so than do the other substances. The system of *points*, in which the latter abound, must not be overlooked. Vegetable points are among the primest of conductors, and become more freely dewed, as also does rough fresh-dug ground. All rough and pointed surfaces are covered with dew, when a well-rolled walk and a hard-bound soil remain comparatively free from a trace of it.

"Dr. Wells, after verifying the facts observed, ascertained by numerous experiments and observations, that the cold at the surface, compared with that of the air above, precedes the formation of Dew, and often exists without Dew being formed; and that bodies become colder than the neighbouring air before they are dewed. The cold, therefore, which Mr. Wilson and Mr. Six supposed to be the effect of dew, was found by Dr. Wells to be the cause of it."

Dr. Wells then directed his attention to this depression of temperature, and he arrived at the conclusion that "it *is produced by the radiation of heat*, without an equivalent return." He reasoned thus—"The surface of the ground allows a portion of the heat which it receives from the solar rays, to escape by radiation when their action is withdrawn; hence its temperature falls; and if the air, holding watery vapour in solution, rest upon it without much agitation, a portion of that vapour will be condensed on the surface, and if the temperature is still lower, will be congealed; thus it is that dew and hoar frost are formed only when the atmosphere is clear, for the clouds return an equivalent portion of radiant heat."

A series of *Letters on the Theory of Dew* are in the course of publication. The *Pharmaceutical Times* contains a Letter by Melloni, abridged for the *Comptes Rendus*. It appears that its direct object is to confirm the theory of Wells, by experiments which make it clear that "Dew neither rises from the earth nor falls from the sky, but that it is produced by the elastic and invisible vapour which is everywhere present in the atmosphere," and, therefore, that "the precipitation of watery vapour is plainly owing to the cold caused by the radiation of bodies towards a clear sky."

There is in this so much "begging of the question," or, in other and plainer terms, the admission of a certain principle that bears the stamp of authority, that we shall feel called upon to meet the question of *radiation* before assent be added to it as a fundamental principle. However, as this must be postponed, and referred to a second article on the Dew, we copy the following details of an experiment by Melloni, which the writer believes must fully establish Dr. Wells's principle.

"On a tin disk, as large and as thin as possible, draw a concentric circle, whose radius shall be equal to one-third of that of the disk, and cover it with a thick layer of varnish. Then take another tin disk, less by ten millimetres (about $\frac{39}{100}$ of an inch) than the varnished circle; and having soldered a pointed iron wire, two millimetres broad, and two or three decimetres (better than 7 inches) long, at its centre, and perpendicular to it, pass the wire through a hole in the centre of the great disk, on the varnished side. The great disk is to be pushed along the wire until the two disks are about five millimetres from each other, at which distance they must be kept. The disks so joined are placed by means of the wire in the open ground of a field, or lawn, quite out of contact with any other body. If the night be calm and fine, the phenomena to be remarked will generally be the following, as a natural result of the arrangement:—The instrument, fixed as described above, has its small bright disk uppermost, hence an annular band of the varnished part of the lower disk will be exposed to the air. This band will (according to the theory) radiate heat, become cool, and be covered with Dew; the central part of the varnished circle—that under the small disk—will remain perfectly dry, whereas the outer metallic band is wetted to its very edge if the atmosphere be extremely damp.

"Another less expected and more interesting phenomenon also occurs; it is the exact repetition of the same appearances on the under surface of the large disk—that turned next the ground; for Dew begins to appear on this surface, exactly opposite the exterior varnished band; a light whitish circle suddenly is seen on the polished metal, and after becoming better defined, spreads little by little, sometimes as far as the edges of the plate in one direction, but never reaches the centre, which remains quite dry and brilliant, like the corresponding portion on the other side of the disk, and the small circular roof which covers without touching it."

From experiments with this simple apparatus, M. Melloni concludes that "Dew does not fall from the sky, because the upper disk is always dry, and the greater part of the lower one is wetted. It does not arise from the ground, because if the exterior part of the lower surface of the great disk is covered, the middle part of it remains perfectly dry and brilliant. The appearance of the Dew, first on the uncovered band of varnish, and its extension to the adjacent and opposite (or under) parts of the great disk, together with the fall of temperature observed on the varnished cases of thermometers exposed freely to the air, demonstrate that Dew is a pure consequence of nocturnal radiation, which gives to good radiators the degree of cold necessary for the condensation of the elastic invisible aqueous vapour which pervades our atmosphere."

The article for August shall place the reader in possession of some facts, and their bearings, which may perhaps afford ground for reflection, and a comparison of phenomena somewhat at variance with those which the advocates of radiation have claimed as the foundation of their hypothesis. In the meantime, we are in possession of two more letters by M. Melloni, in the last of which he makes it appear that some of the editors of our periodicals have either mistaken or misrepresented his objects, and that he did not intend altogether to sanction Dr. Wells's theory, or justify the conclusions at which he arrived. We ourselves observe nothing very satisfactory in M. Melloni's papers, but further observations must be postponed to a future occasion.

ON THE CULTIVATION OF THE CHERIMOYER AND OTHER SPECIES OF CUSTARD APPLES, AS FRUIT TREES.

The Cherimoyer, or soft-fruited Custard Apple, is the *Anona Cherimolia* of our botanical catalogues, but was called *Anona tripetala* by Sims, in the "Botanical Magazine," t. 2011, and by Aiton, in his "Hortus Kewensis," ii, p. 252. This genus, in connexion with several others, forms a natural order called *Anonaceæ*.

A. Cherimolia forms a tree-like shrub, twenty or thirty feet high. The leaves are ovate-lanceolate, somewhat obtuse, free from dots, the upper surface deep green, and the under surface glaucous, clothed with a short silky pubescence, and when bruised emitting a strong odour resembling that of the Black Currant tree. *Peduncles* short, usually opposite to the leaves, covered with a ferrugineous tomentum, and each bearing a solitary flower. *Sepals* three, connected at the base, concave, somewhate cordate, rather acute, clothed on the outside with ferrugineous tomentum like the peduncles. *Petals* six; three outer ones coriaceous, linear-oblong, narrow, triquetrous at the top, concave at the base, where each is marked with a deep purple spot, the general colour brownish-green; inner petals so small as to be mere scales. *Anthers* indefinite, almost sessile, angular, and swelled at the top. *Carpels* numerous, sessile, joined into one, fleshy, many-celled, somewhat cordate fruit, covered with a slightly scaly coat; when ripe, of a pale greenish-yellow, tinged with dark purple on the sunny side, and usually weighing from three to four pounds; the skin is thin, and easily separable; the flesh is sweet, highly flavoured, and of about the consistence of a custard. The *seeds* are few in number, smooth, and are easily separated from the pulp.

The plant is a native of Peru, New Grenada, and several other parts of South America, where it is extensively cultivated, and has the reputation of producing one of the finest fruits in the world. Mr. Gibson, whilst on his mission to India as a botanical collector in 1836, had repeated opportunities of eating this fruit, and he considers its merits greatly over-rated. There is no doubt, however, but amongst so many varieties of the Cherimoyer which are cultivated in the tropics, the relative value of some is much greater than of others, and the peculiar flavour and consistence of the fruit of all the varieties may be distasteful at first to persons unaccustomed to eat them; by those who constantly use them, however, they are esteemed very agreeable, containing a rich sugary mucilage, which for the most part predominates over the singular, but not altogether unpleasant aroma.

The plant was introduced from South America in 1739, but has not yet produced fruit in this country, although it has often flowered in different collections; but the flowers have for the most part fallen without setting fruit, and when any have set, they have been so feeble and deformed that they have never arrived at maturity.

We have at Chatsworth several large specimens growing in different parts of the Great Conservatory, and from some years of careful observations on their habits and requirements, we would suggest the following as requisite for their successful management as fruit trees:—

The best soil is without doubt a light sandy loam, not too rich; or if that cannot be obtained, equal parts of stronger loam and sandy peat. And whether the plant be grown in a pot or tub, or in the border of a stove, good drainage either with broken stones or crocks is of great importance.

In its native habitats, this plant is found in situations where it is exposed, for several months in the year, to a dry atmosphere, and a low temperature, where little moisture can reach the roots; while in the other part of the year, a moderate heat, a humid atmosphere, and plenty of moisture at the roots is supplied. Now we have ever found that during the season of its most vigorous growth, it thrives the best in a heat not exceeding 75°; if much advance is made on this, the young fruit are sure to fall prematurely, and the crop for that season at least is lost.

The supply of water to the roots during the season of growth and fruiting should be liberal, but this must be greatly diminished after the fruit is gathered; as during the season of rest very little water is required, and the heat should not in winter exceed that given to common greenhouse plants, that is, merely sufficient to keep out the frost; by this means the wood will become hardened, and the leaves deciduous, which two points are of immense importance in the culture of this plant as a fruit-bearer.

Pruning is unnecessary, and is perhaps in most cases injurious, the bloom being formed on the old wood; with good management flowers will continue to be produced successively during May, June, and July, and the fruiting will be prolonged in the same proportion. The flowers, although not conspicuous, are very curious, and in addition emit a rather pleasant fragrance.

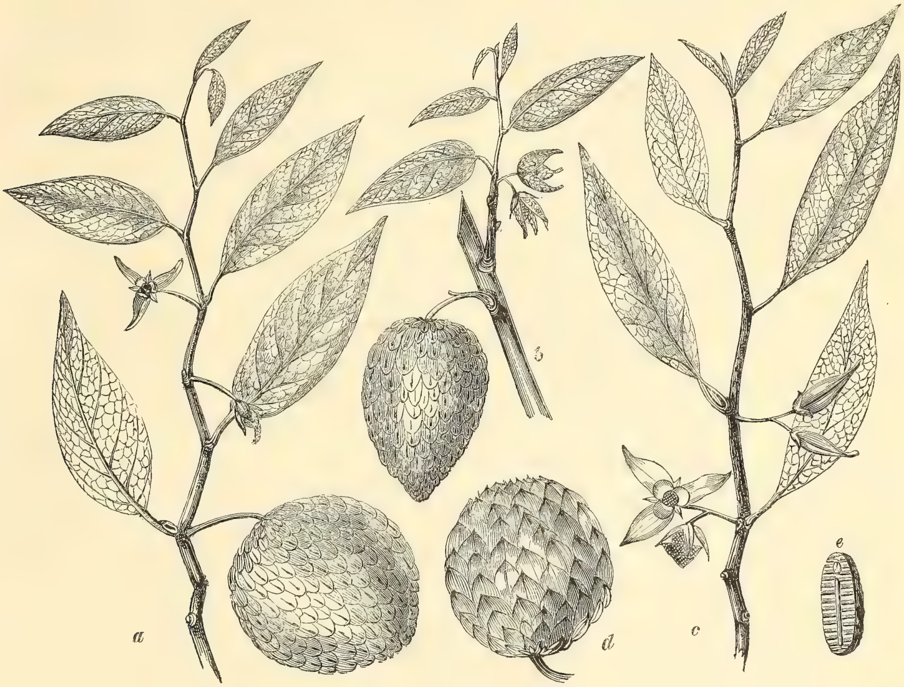
Artificial fertilisation is indispensable, otherwise no matter how great the show of bloom, very few if any fruit will be obtained; but should a small quantity set, they are sure to be deformed, and perhaps not one will arrive at maturity. A small camel-hair brush is the best instrument with which to effect the operation.

THE SOUR-SOP (*Anona muricata* of Linnæus, *b.*), is a native of the West Indies, and various parts of South America. It is almost universally cultivated in the tropics for the sake of its fruit, which though inferior to the Cherimoyer, is highly esteemed by the natives. It contains, however, a very large proportion of acid, and on that account is not much relished by Europeans.

It forms a spreading shrub fifteen or twenty feet high. The *leaves* are ovate-lanceolate, smooth, somewhat shining, and when bruised emit a fragrance resembling that of black currants. The *peduncles* are solitary, and single-flowered. *Flowers* fragrant. *Sepals* three, connected at the base, cordate, and acute. *Petals* six, concave, thick, cordate, ovate, green outside, yellow within, having a deep purple spot at the base of each; outer petals acute, inner ones small and blunt. *Fruit* fleshy, somewhat less than the Cherimoyer, of a yellow colour, having a thin skin covered with scales; flesh soft, of the consistence of custard.

To ripen this fruit properly, it should receive a little more heat than is necessary for the Cherimoyer, but in other respects it may be treated exactly in the same manner. It was introduced to this country in 1656, but has never yet, that we are aware of, matured fruit in our stoves, although it is a plant of very easy management.

THE SWEET-SOP (*Anona squamosa* of Linnæus, *c.*), is also a native of South America, and is extensively cultivated both there, and in the East and West Indies. It forms a spreading shrub fifteen or twenty feet high. The *leaves* are oblong, bluntish, smooth, full of pellucid dots, rather glaucous beneath, and fragrant when bruised. *Peduncles* solitary and single-flowered. The *flowers* are greenish-yellow and sweet-scented. *Sepals* three, small, acute. *Petals* six; outer ones linear-oblong, narrow, triquetrous at the apex, somewhat concave at the base, nearly closed, inner petals merely rudimentary scales. *Fruit* egg-shaped, fleshy, covered with a thin tubercular coat; the pulp is sweet and possesses a peculiar flavour, which is much esteemed in all tropical countries. The culture is exactly the same as for the Sour-Sop (*A. muricata*). It was introduced to this country in 1739.



DESCRIPTION OF THE WOOD-CUT.

a Anona Cherimolia, showing the flower and fruit.
b Anona muricata.
c Anona squamosa.
d Detached fruit of *A. squamosa.*
e Seed of *A. squamosa.*

The Common Custard-Apple (*Anona reticulata* of Linnæus) grows from twenty to thirty feet high, and is a native of the Caribbee Islands, and Brazil, in which latter place, the fruit bears the name of *Condissa*, or *Frute de Conde.* It was introduced to our collections in 1690. In growth it greatly resembles *A. squamosa*, but the smell is less pleasant. The *leaves* are oblong-lanceolate, acute, smooth, and somewhat dotted. The *peduncles* are solitary. The *flowers* are rusty-tomentose on the outside, and pale yellow within. *Sepals* three, rusty-brown, acute. *Petals* six; outer ones oblong-lanceolate, acute, nearly closed, excavated at the base, each marked with a dark purple spot, and covered on the outside with ferrugineous tomentum; inner ones small, acute. *Fruit* ovate-globose, reticulately-areolate, and when ripe is pale yellow, tinged with dull red, and usually measures about six inches in diameter. The *flesh* is pale yellow, and of about the consistence of custard, whence it has its name. The fruit is much esteemed by the natives, and is extensively cultivated in both the East and West Indies. The culture is exactly the same as for the Sour-Sop (*A muricata*).

THE ALLIGATOR APPLE (*Anona palustris* of Linnæus).—This species grows naturally in swampy places in South America and Jamaica; where it forms a low, spreading shrub, seldom exceeding fifteen feet in height. The *leaves* are ovate-oblong, coriaceous, and smooth. The *peduncles* are short and solitary. The *flowers* are yellow. *Petals* six, acute; three outer ones veined on the outside, and each having a deep red blotch at the base inside; three inner petals small, white on the outside and deep blood-red within. The *fruit* is rather areolate, large, smooth, heart-shaped, and sweet-scented. It is also said to have an agreeable flavour, but being somewhat narcotic, is seldom eaten. The natives, however, make a very nice wine from it, which may be drunk without injury.

The wood is well-known in Jamaica by the name of American Cork, and is well adapted, from its extreme lightness and elasticity, to be used for the same purposes as true cork (*Quercus suber*). The culture is in every respect the same as *A. muricata.* It was introduced to this country in 1731.

THE PINAUO, OR PINHA (*Anona punctata* of Aublet).—This plant forms a tree-like shrub, twenty feet or more high. The *leaves* are ovate-oblong, acute, and smooth. The *flowers* are solitary, small, axillary, nearly sessile, and pale yellow. *Petals* six, acute; three outer ones the largest. *Fruit* almost globose, about the size of an orange, dotted, fleshy, of an obscure brown colour; pulp red, and pleasant to the taste. By cultivation there is little doubt but this fruit might be greatly improved, and become very good for table. It was introduced from Cayenne in 1822, where it grows naturally on the borders of streams and rivers. Its cultivation is the same as that recommended for the Sour-Sop.

THE PINAIOUA (*Anona longifolia* of Aublet).—This species is abundant in Guiana and Trinidad, growing vigorously on the borders of streams, and forming a shrub about twenty feet in height. The *leaves* are oblong-acuminate, mucronate, smooth. *Peduncles* long and axillary. *Flowers* solitary, large, dingy purple. *Petals* six, acute; outer ones large, inner ones small. *Fruit* ovate-globose, dotted and reticulated; flesh gelatinous, pale red, and pleasant to the taste. It was introduced to this country in 1820, and may be treated exactly as recommended for the Sour-Sop.

THE SENEGAL CUSTARD APPLE (*Anona Senegalensis* of Pers).—This is a native of Guinea, where it grows in thickets, and forms a straggling bush six feet or more in height. The *leaves* are elliptical, leathery, glaucous, somewhat emarginate at the apex, upper surface smooth, under surface as well as the branches and petioles covered with rusty pubescence. *Peduncles* solitary or twin, axillary, rather pendulous. *Petals* coriaceous, of a greenish yellow colour. *Fruit* small, scaly, when ripe of a pale yellow, and contains a soft, excellent-tasted pulp, *Don's Syst.* It was introduced in 1823, and may be cultivated in every respect in the same manner as the Sour-Sop.

Cinereous Custard Apple (*Anona cinerea* of De Cand.)—This species bears an excellent fruit, and is much cultivated in the West Indies, where it forms a thick spreading bush, twenty feet in height. *Leaves* oblong-elliptical, somewhat lanceolate, dotted, pubescent on the under surface. *Flowers* solitary. *Petals* six; outer ones linear-oblong, narrow, triquetrous at the top, somewhat concave at the base, nearly closed; inner petals very minute. *Fruit* fleshy, ovate-globose, covered with a thin scaly coat. It was introduced in 1823, and may be treated exactly like the Sour-Sop.

Marsh Custard Apple (*Anona paludosa* of Aublet).—A native of Guiana, growing in marshy places, and forming a low shrub about four feet in height, bearing abundance of small orange-like fruit. The *leaves* are oblong, acute, tomentose on both surfaces, and rufescent beneath. The *flowers* are solitary, and produced on short peduncles. *Petals* six, acute, yellowish-green, silky on the outside; inner petals small. *Fruit* with a very grateful flavour, and might no doubt be greatly improved by cultivation. It was introduced in 1803, and may be treated like the Sour-Sop.

Smooth Custard Apple (*Anona glabra*, of Linnæus). A greenhouse species, native of Carolina, and cultivated in some parts of South America and the West Indies. It forms a shrub twelve or sixteen feet in height. The *leaves* are ovate-lanceolate and smooth. The peduncles are seated opposite to the leaves, and are two-flowered. The *calyx* is coriaceous, trifid, large, somewhat campanulate, and brown on the outside. *Petals* six; outer ones ovate, obtuse, inner ones smaller, lanceolate. *Fruit* conical, blunt, smooth, of a yellowish green colour, with a pulp about the consistence of a ripe pear, sweet and luscious to the taste, but rather too deficient of acid. In cultivation it may be treated in the same way as recommended for the Cherimoyer; there is little doubt, however, but this species would do well against a conservative wall, and might perhaps in such a situation ripen its fruit, especially in some of the warmer counties.

Wood Custard Apple (*Anona sylvatica* of St. Hil.). A native of Brazil, where in the natural woods it grows to the height of eighteen or twenty feet. The timber is in much request for various domestic purposes, being light, and very close-grained. The *leaves* are large, elliptical, short pointed, pubescent, and full of pellucid dots. *Peduncles* solitary. *Fruit* about the size of an orange, and said to have a very good flavour. It has not yet been introduced to this country, but will most likely require similar treatment to the Cherimoyer.

The whole of the above species of Custard-apple, with the exception of *A. glabra*, are hardy stove plants, and perhaps even the latter would not ripen its fruit properly without stove heat. They all delight in a soil light, sandy, and only moderately rich; good drainage is indispensable; strong heat is not necessary for their welfare; pruning is not required; they bear full exposure to the light; liberal watering during their time of growth and fruiting, and but a small portion during the winter. The winter temperature should be low, not exceeding that given to common greenhouse plants, and artificial fertilisation must be adopted to set the fruit. Their culture might be carried out at very little expense and trouble; the heat required would scarcely be more than is given in the peach house during the forcing season, although it might require to be rather more prolonged than for the Peach. A little bottom-heat by a tank passing through the bed would be of great advantage. Propagation is effected by cuttings of the half-ripened wood planted in pots of sand, and placed under a handglass in a moist heat; the leaves of the cuttings should, however, be left without mutilation, otherwise the formation of roots will be greatly retarded. Seeds sown in pots, and plunged in a good hotbed, make very vigorous growing plants, but are many years before they produce flowers.

THE MYRRH TREE.

The gum-resin called *Myrrh*, so long known and deservedly esteemed, both as a perfume and in medicine, is a vegetable production issuing spontaneously, or by incision, from shrubs growing in Arabia and Abyssinia. Writers, however, scarcely agree as to the particular species from which it is obtained; and although the article has been in use for more than two thousand years, botanists have unfortunately paid so little attention to the subject, that their testimony cannot by any means be considered conclusive.

Myrrh, as procured in our shops, is received from the East Indies in the form of yellowish-red tears, varying in size from a hemp-seed to a large hazel nut, and are brittle, shining, and semi-transparent. The taste is rather disagreeable, being bitter and acrid, with a peculiar aroma; and the fragrance is strong, but not particularly pleasant. The uses to which it has been applied are various. Administered internally as medicine, it is considered stimulant and tonic, and has been successfully used in a variety of diseases.

It was also formerly much valued on account of its property of resisting putrefaction, and therefore, at a very early date, it formed one of the ingredients, made use of by the ancients in embalming their dead; and, being very costly, often formed an important item in the presents of the great. The Magi who came to see the infant Messiah, presented Myrrh, in connection with gold and frankincense, as a token of the highest respect and honour which they could show to one whom, they judged, would eventually become the greatest monarch that ever reigned upon the earth.

The best kind of this gum-resin is stated by the editor of the "*Flora Medica*," v. ii., p. 213, to be brought from Troglodytitia, a province of Abyssinia, on the borders of the Red Sea, and the tree is said by Bruce to grow behind Azab, along the coasts towards the Straits of Babelmandeb. The author of the "Periplus" names the ports at which it was procurable in ancient times, which were Malao, Masylon and Aromata, perhaps our modern Tajoura, Zeila, and Berbera, on the eastern or Soumalee coast of Africa. The plant appears to have been known both to Strabo, Dioscorides, and Pliny, all of whom mention it as growing plentifully in the land of the Sabæans; and we are told that Alexander's army found vast numbers of Myrrh trees growing in the territory of the Gadrossi.

Major Harris, in the "Annals of Natural History," describes the Myrrh tree as "growing abundantly on the Abyssinian coast of the Red Sea, over all the barren hill-sides of the low zone inhabited by the *Danakil* or *Adaiel* tribes. It is called *Kurbeta*, and there exist two varieties, one producing the better description of the gum, being a dwarf shrub, with deeply-serrated crisp leaves, of a dull-green; while the other, which yields a substance more like *Balm* than *Myrrh*, attains the height of ten feet, and has bright, shining, slightly dentated leaves. The Myrrh called *Hofali* flows freely from any wound, in the form of a milky juice, possessing a perceptible acidity, which either evaporates, or becomes chemically changed during the formation of the gum.

The seasons for collecting it are in January, when the buds appear, after the first rain, and in March, when the seeds are ripe. Every passer-by transfers such portions as he may find to the hollow boss of his shield, and exchanges it for a handful of tobacco with the next slave-dealer whom he meets on his caravan route. The merchants also of the sea-coast, before returning from Abyssinia, send into the forests that gird the western bank of the river Hawash, and bring away considerable quantities of the *Hofali*, which is sold at a high price. The natives administer it to their horses in cases of fatigue and exhaustion."*

Various have been the opinions of modern travellers as to the particular species of plant which yields this valuable article. Some have thought it to be the *Balsamodendron Gileadensis* (*a*), and have supposed the gum known by the name of Balsam of Gilead, to be obtained exclusively from *B. opobalsamum*. Others again judge that our supplies received from the East are procured from *Colophonia Zeylanica*, a plant growing plentifully both in Ceylon and in various parts of the Indian continent.

Colophonia zeylanica, *c*, (the *Balsamodendron zeylanicum* of Kunth, and the *Amyris zeylanica* of Retz), forms a tree-like shrub fifteen feet or more in height. The *leaves* are pinnate; pinnæ five or seven, ovate, acute, and stalked. *Racemes* of flowers axillary, in interrupted clusters, involucrated, and downy. *Calyx* three-toothed. *Petals* three. *Stamens* six. *Drupe* dry, containing a three-celled bony seed.

Nees von Esenbeck considers the species an undescribed one, and has given it the name of *Balsamodendron Myrrha*, whilst others again believe that the gum is supplied from *B. Africanum*, the Niouttout of Adanson, which is figured and described in our present volume of the "Magazine of Botany," page 93.

---

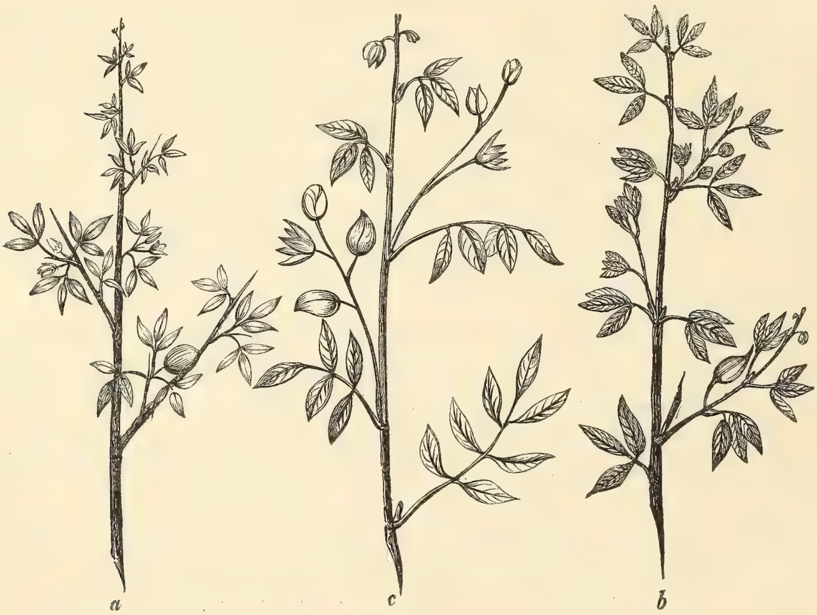
* Gard. Chron.

Although true Myrrh or *Hofali* is yielded by only one particular kind of plant, yet there is little doubt but the produce of all the above, and perhaps several other allied species, are mixed with it, previously to its exportation to other and distant countries, which may in some measure account for the different opinions of persons who have visited the localities where the plants grow.

There are growing naturally in the rocky parts of Arabia, two species of *Balsamodendron;* one is known by the native name of Kafal, and the other Kataf; one of which may possibly on further examination be found to be identical with *B. Myrrha* of Nees, and the other may not unlikely prove to be *B. Africanum.*

Balsamodendron Kafal (*b*) grows to a bush about twelve or fifteen feet high, corresponding in some degree with Major Harris's description of his second variety of Myrrh tree. The *leaves* are trifoliate, leaflets serrated at the top, the younger ones villous. *Calyx* four-toothed, permanent. *Petals* four, linear-oblong, induplicate, valvate in æstivation. *Berry* compressed, with a prominent dot at the top. Whether this plant is identical with *B. Africanum*, the Niouttout of Adanson, it is difficult to say. It is stated to be found growing upon the rocks about 1000 feet above the level of the sea, and thus clothing the arid waste with a lovely verdure, and at the same time supplying an article of great value to mankind.

Balsamodendron Kataf, of *Kunth*, (*b*) the *Amyris Kataf*, of Forsk,—is a dwarf spreading shrub, reaching sometimes from twelve to fourteen feet in height, but



DESCRIPTION OF THE WOODCUT.

a Balsamodendron Gileadensis. *b* Balsamodendron Kataf. *c* Colophonia zeylanica.

more commonly not exceeding four or five. The leaves are palmately trifoliate; leaflets sessile, smooth, serrated towards the point. *Pedicels* bifid. *Flowers* of separate sexes. *Calyx* four-toothed, persistent. *Petals* four, linear-oblong, acute, white, tinged with pale rose. *Disk* cup-shaped, with elevated worts. *Stamens* eight, inserted under the disk. *Berry* globose, umbilicate at the apex, one or two-celled. *Seeds* solitary.

This plant occupies similar situations to *B. Kafal,* growing abundantly amongst the barren rocks. The gum which oozes from wounds, inflicted on the plants for the purpose, is of the same colour, and appears to possess exactly the same properties as the true Myrrh, being semitransparent, brittle, and shining, and in taste bitter and slightly acrid; taking all things together, we cannot avoid thinking but the *Balsamadendron Myrrha,* of Kunth, and the *Balsamadendron Kataf,* of Forsk, are identical, and that any difference in the verdure and size of the shrubs may be satisfactorily accounted for, from a difference in their situations of growth.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE "BOTANICAL MAGAZINE" AND OTHER LEADING PERIODICALS FOR MAY AND JUNE.

Alloplectus concolor (*Whole-coloured Alloplectus*). An undoubted congener with *Alloplectus diochrous,* having the same habit, but smaller flowers, calyx and corolla uniformly red, the latter much more ventricose above at the upper part of the tube, with the mouth more oblique. It is, we presume, an inhabitant of Brazil, having been sent to Kew by Mr. Galeotti, in 1846, under the garden-name of *A. eriocalyx,* without any indication of its locality. The flowers are red, very hairy, and produced in clusters from the axils of the leaves.—*Bot. Mag.*, 4371.

Angræcum caudatum (*Long-tailed Angræcum*). A species of the rare genus Angræcum, producing green and white flowers, and with so remarkable a spur that, as Dr. Lindley observes, it has no parallel but in the *Habenaria longicauda* and *Angræcum sesquipedale.* It is a native of Sierra Leone, whence it was imported by Messrs. Loddiges, of Hackney, but is still rare in our stoves. Attached to rough pieces of wood, and suspended from the ceiling, it flowers in October.—*Bot. Mag.*, 4370.

Anopterus glandulosus (*Glandular-leaved Anopterus*). A truly handsome evergreen shrub, native of Van Diemen's Land, and introduced to the Royal Gardens of Kew, by Ronald Gunn, Esq. It has hitherto been treated as a greenhouse plant, but in the mild parts of England, near the coast, it would in all probability bear the open air all the year round, perhaps even about London, if trained to a wall having a good aspect. Its season of flowering (winter) would be unfavourable to the blossoming in such a situation; but the fine dark-green foliage, not much unlike that of *Photinia serrulata,* is at all times a recommendation. The flowers are white, and produced in axillary racemes.—*Bot. Mag.*, 4377.

Aristolochia grandiflora, described *Bot. Mag.*, 4368-9. See *Mag. Bot.*, p. 117, of the current volume.

Corynocarpus lævigata (*Smooth-leaved Corynocarpus*). A native of New Zealand. The flowers have little to recommend them, yet the plant itself forms a tree "*Karaka*" of the natives, upon which the eye of the traveller rests with pleasure, by reason of its rich dark glossy leaves, and highly ornamental growth; and it furnishes a plum-like fruit, of which the drupaceous coat, when fully ripe, and of a sweetish taste, is eaten by the natives. The nut or kernel, also, upon being deprived (by steaming and maceration in salt-water) of the poisonous property it is said to possess, is held in considerable estimation by the New Zealanders, who collect and use it for food in seasons of dearth. It is a greenhouse plant, and flowers in May.—*Bot. Mag.*, 4379.

Echinocactus chlorophthalmus (*Green-eyed Echinocactus*). This purple-flowering succulent plant is a native of Real del Monte, Mexico ; it blooms in the summer months, and will rank next to *E. hexædrophorus.*

Fuchsia spectabilis (*Showy Fuchsia*). From the collection of Messrs. Veitch and Sons, Exeter, who gratified the Members of theHorticultural Society, by the exhibition of it at their rooms in Regent Street, April 18, 1848—*Mag. Bot.*, p. 95—when the large silver medal of the Society was awarded to it. It was then stated to be the *F. loxensis* of Humboldt, and one of the handsomest Fuchsias yet in cultivation ; its dark-green leaves and brilliant scarlet flowers, with which the white lobed stigma nicely contrasts, renders it extremely attractive. To this character of its beauty may be added, the blood-red colour of the flowering branches, and rich purple of the under side of the leaves, contrasted with the almost velvety rich green of their surface. It is a native of shady woods, on the mountains of Peru, and is stated by Mr. Lobb, its discoverer, to be the "loveliest of the lovely."—*Bot. Mag.*, 4375.

Gesneria libanensis (*Many-flowered Gesneria*). This is the *Conradia floribunda* of *Mag. Bot.* p. 99, of the current volume. This plant is a native of Cuba, and was received at the Royal Gardens at Kew, from Mr. Van Houtte, under the name of *Rytidophyllum floribundum ;* but it neither coincides with that genus in character nor in habit. It appears, according to Walpers, that it was previously described by Morren as *Gesneria libanensis ;* but it ill agrees with true *Gesneria*, rather with certain West Indian species, which are referred to *Conradia*, by Martius and De Candolle, though probably without sufficient examination.—*Bot. Mag.*, 4380.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Abelia floribunda.—In the nursery of Messrs. Henderson, Edgeware Road, is flowering this very graceful shrub : it is a native of Mexico, and nearly hardy, having been kept in a cold pit all last winter. The flowers are produced at the ends of the shoots, in groups of six or seven, pendulous and tubular, of a bright rose-colour, and nearly two-and-a-half inches long, foliage neat and good. The plant is in an excellent state of cultivation, completely laden with its handsome flowers.

Arpophyllum giganteum.—Messrs. Rollisson, Tooting, recently flowered the above, which represents a race of plants never before seen alive in this country, and shows, though but a small weak specimen, that when it attains the growth of the dried specimens which have been received in this country, it will be a most desirable plant. The flower, though small, is a deep and rich purple, densely placed upon the stem, which attains the length of eighteen inches ; having a very graceful appearance, allied to its rich colour, gives it a decided advantage over many species that bear much larger flowers.

Cantua bicolor.—We have been favoured with a neat specimen of the above from Messrs. Veitch, Exeter. It appears to be a dwarf shrub, with neat bright-green foliage ; the stem and edges of the leaves are clothed with short hairs. The flower is about an inch-and-a-half long, spreading at the mouth to about the same in diameter ; it is a most lively carnation colour, shading to a rich yellow in the throat, the short tube externally and internally a bright yellow : the carnation is equally bright at the back of the petals. Its appearance is that of a very profuse bloomer, and is one of the handsomest plants of recent introduction.

Cœlogyne, spe. nov. A very fine species, introduced from Borneo by Mr. H. Low, Clapton, has been flowered for the first time by Mr. Mylam, gardener to S. Rucker, Esq., and though in a weak state, still sufficient is seen to prove it a valuable addition. The flower-scape is about thirty inches long, densely laden with cream-coloured flowers, the labellum enriched with a dash of bright orange. The foliage is ample and graceful, being near the length of the scape. Mr. Eyles, gardener to Sir G. Larpent, also has had it in good flower, but not equal in size to the dried specimens introduced with the plant.

Hoya Imperialis. This is another handsome plant, introduced by Mr. Low, two years since from Borneo, and exhibited by Messrs. Pince and Co., Nurserymen, Exeter, in flower for the first time, at the June Fête of the Royal Botanical Society. The plant has a fine and noble habit, with handsome foliage. The flowers, six in number, radiate at the end of a short stem about eight inches long, and are of a brownish purple colour, with a large raised pure white star-like substance in centre ; they are glossy and wax-like, about two inches in diameter.

LILIUMS. Seedling varieties raised some years since from *L. bulbiferum* crossed with *L. atrosanguineum*, and are all quite hardy. We noticed them in the nursery of Mr. Groom, of Clapham Rise. No. 1. The Nabob, twenty-two inches high, very bright and rich orange, with deep blood-coloured blotches, well thrown over the petals, which were finely formed, very showy, producing from twelve to fifteen flowers on a stem. No. 2. Louis-Philippe, twenty-six inches high, very bright deep red, with a few dark blotches and some black spots ; this is a brilliant flower, the stalk holding sixteen to twenty blooms. No. 3. Vulcan, twenty-two inches high, very dark red, with blood-coloured blotches, the darkest variety, and carries from twelve to sixteen flowers on a stalk. No. 4. Atlas, twenty four inches high, light orange, with reddish-brown patches ; strong grower, producing sixteen to twenty flowers. No. 5. Duke of Wellington, sixteen inches high, bright rich red, with a few dark red blotches, very showy and dwarf, ten to sixteen flowers on a stem. No. 6. Titian, fifteen inches high, a red orange, with a few dark spots ; excellent flower, and very free bloomer, sixteen to twenty flowers on the stem. No. 7. Voltaire, thirteen inches high, fine bright orange, very well covered with patches of reddish-brown : this is the finest of the orange varieties and very distinct ; produces twelve to fifteen flowers. No. 8. Rubens, nineteen inches high, rich dark-red, with a few blotches of blood colour and some black spots ; very showy kind, produces ten to fourteen flowers on a stem. All the above varieties are worthy of very extensive cultivation.

MITRARIA COCCINEA. Messrs. Veitch have lately flowered this novelty, and as it is quite hardy, will be a great acquisition to our gardens. The plant was about three feet high, with small neat foliage placed opposite on each side of the stem ; from the axils of which the flowers are produced singly, an inch-and-a-half long, and are of a brilliant scarlet colour ; they hang from the foliage at the end of a peduncle two inches long, and have a graceful and ornamental appearance.

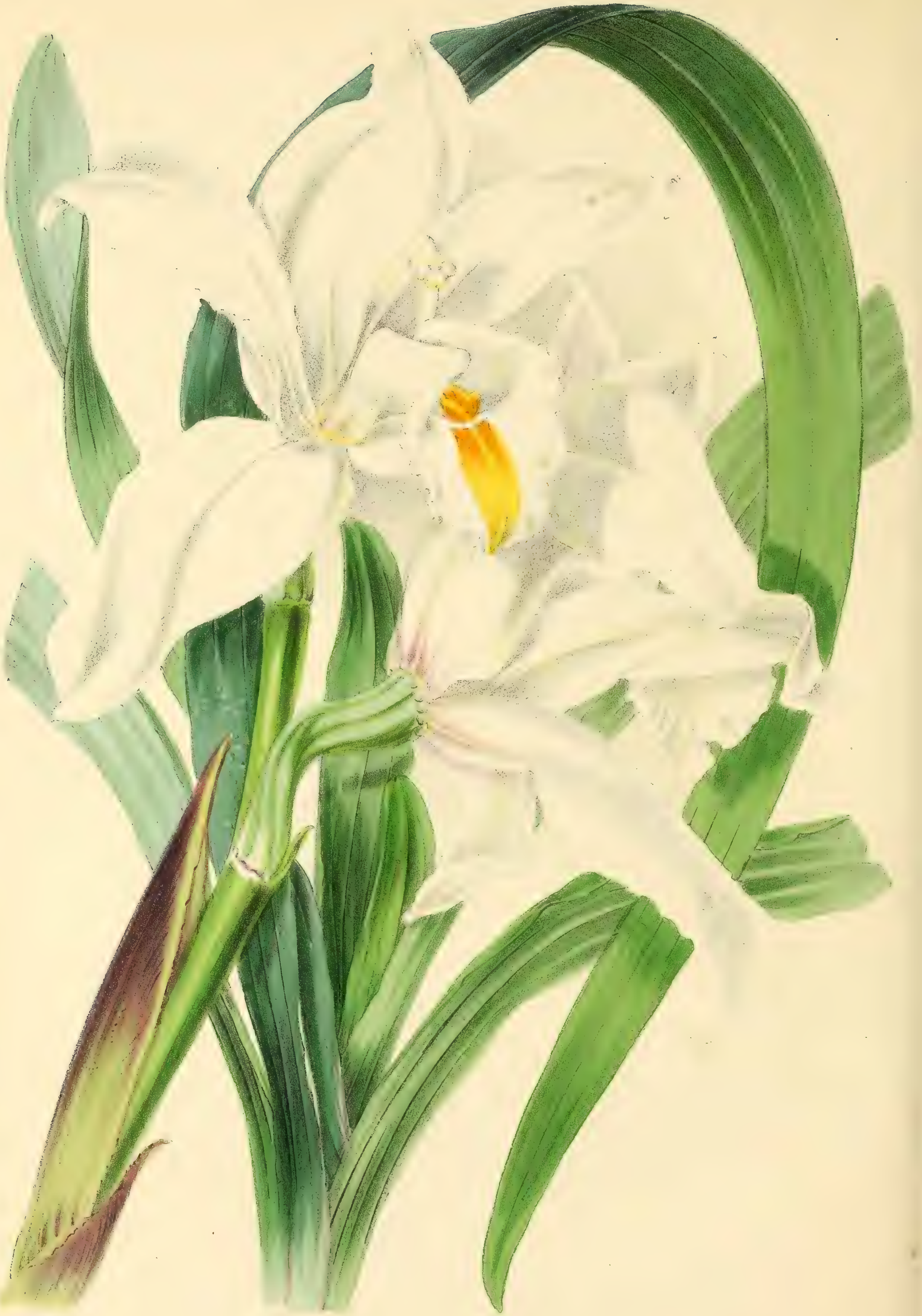
Among the fine specimens exhibited at the fête of the Horticultural and Royal Botanical Societies, the following were the finest :—*Erica Shannoni, Clewsiana* (*Pamplin's*), *elegans, procumbens, perspicua nana, ventricosa splendens, Massoni*, the finest plant in existence, we should say, and *Westphalingia*, were sent by Mr. Hunt, Gardener to Miss Trail, Bromley. *E. metulæflora, ventricosa fragrans coccinea, tricolor* and *densa*, by Mr. Mylam, Gardener to S. Rucker, Esq.; *E. elegans*, a noble specimen, from Mr. Pawley, Bromley. *E. vent. superba*, very fine, from Mr. Malyon ; *E. splendens* and *Massoni*, from Mr. May ; *E. mutabilis*, from Mr. Bruce ; a noble specimen of the same, from Messrs. Veitch ; *E. Cavendishii* and *tricolor* (Wilson's *var.*), from Mr. Green, along with the latter, were fine plants of *Leschenaultia Baxteri*, the old *Allamanda cathartica, Stephanotis floribundus, Tetratheca verticillata, Chorozema ericoides, Franciscea augusta*, and several *Epiphyllums* admirably flowered. Mr. Jack exhibited a superb specimen of *Leschenaultia biloba, Franciscea acuminata*, &c.; Mr. Falconer had a fine *Leschenaultia formosa*. Mr. Carson exhibited a *Plumbago capensis*, and *Dipladenia splendens, Dillwynia floribunda*, a neat little yellow flower in fine condition, and a noble specimen of the *Vinca rosea* sent by Mr. Malyon. *Russelia juncea, Aphelexis sesamoides*, and *humilis*, from Mr. Bruce.—*Gardenia Stanleyana*, in fine flower, the best we have seen, sent by Mr. Iveson, gardener to the Dowager Duchess of Northumberland, Sion House ; a Heath from Mr. Jackson, Kingston, called *E. jubata rubra. Echinocactus claviformis*, a pale flower, almost white, but produced in great abundance on a very small plant exhibited by Mr. Hoyle, Reading. Mr. Ambrose, of Battersea, exhibited a new fancy Pelargonium, a dark flower, almost a chocolate-colour, good shape, and had a very even margin of white round all the petals. Mr. Holmes, Florist, Sudbury, exhibited a remarkable herbaceous Poppy, single, and a most brilliant orange, considerably enriched by blotches of dark purple at the base of the petals ; a serviceable plant for the background of borders. Among the collections of *Orchids* were the following fine specimens :—*Aerides affine*, with twelve scapes, *Saccolabium guttatum*, fifteen scapes, *Oncidium Lanceanum*, with ten, and several others in the collection of Mr. Mylam, gardener to S. Rucker, Esq. ; *Barkeria spectabilis*, an admirable specimen, and an enormous one, of *Sobralia macrantha*, and *Schomburgkia tibicinis*, with a scape ten feet long, from Mr. Basset, gardener to R. S. Holford, Esq. Mr. Rae exhibited a fine *Stanhopea oculata* and a new variety between *S. insignis* and *Devoniensis*, a pretty spotted flower. Mr. Dobson, gardener to E. Beck, Esq., had a fine *Aerides crispum*, and a variety of *Barkeria spectabilis*, having a deep purple blotch at the end of the lip instead of being spotted. Mr. Plant showed a new variety of Aerides, seemingly between *A. crispum* and *maculosum*, the flower growing upright; a fine plant of *Brassia Wrayii* and *Saccolabium guttatum*. Mr. Donald, gardener to Mrs. Laurence, exhibited a Mormodes of great beauty, having a scape ten or twelve inches long, covered with large bright yellow flowers, spotted with rich brown; *Barkeria Laurenceana*, a pale lilac flower, and a fine *Stanhopea tigrina*.

OPERATIONS FOR JULY.

It is not improbable but the wetness of the last two or three weeks may be succeeded by a period of drought, similar to that which preceded the wet. Should such be the case, the ground will soon become dry, and attention to watering will be required. Often pass the hoe through the soil; it not only destroys the young growing weeds, but, by loosening the surface, greatly facilitates the growth of the plants. If late annuals are a desideratum, they may be sown during the first and second weeks; it is well to soak the seeds in tepid water, for an hour previously to their deposition in the soil, which should also be well moistened. Continue to make up any deficiencies in the flower-garden. Towards the end, or earlier if the weather continues wet, budding of roses should be proceeded with; should, however, the weather prove dry, and the bark in consequence not rise well, water the plants freely for two or three days with weak liquid manure, which will greatly stimulate their growth, and generally answer the desired end. The routine work consists, in pegging down the young shoots of those plants, intended to spread over the surface; stopping such as require it, that over-luxuriance may be checked, and they may be induced to branch and become bushy; tying and training others which require support; thinning or cutting away anything superfluous, and especially removing dead flowers, or seed-vessels which are not required, and if left to arrive at maturity, would stop the vigorous fertility of the plants; propagating by layers and cuttings, according to the kind. Mowing, edging, and keeping everything as neat as circumstances will admit of.

In the Conservatory and Greenhouse, Camellias, which were removed to cooler quarters after having finished their growth, will now have fully formed their flower-buds; when this is the case, they may receive two or three times a week, a supply of weak liquid-manure water. Chinese Azaleas, *Rhododendron arboreum* and its varieties, &c., are now making a vigorous growth. Do not fail in fine weather, to often sprinkle both the soil and the walks of the house, to induce a sufficient supply of humidity; and if the sun be very bright, it is advisable to draw some light screen over the surface, for an hour or two in mid-day. Almost all greenhouse plants require well attending to, with water at their roots: and some derive great advantage by having a pan filled with it placed beneath the pot; as *Nerium splendens*, &c. Such greenhouse plants as have formed their wood, should be removed from the general growing stimuli to cooler quarters, that the new formed wood, may become hardened and matured. Air, too, is most important, especially at this time of the year, without which it is not possible, that any plants can perform properly the functions allotted to them.

In the Stove all straggling shoots should be tied in or stopped, that the plants may be rendered neat and bushy. Many that have made vigorous growth, will require shifting. Always mind that good drainage is given, for no after care will compensate for the neglect of this. Give abundance of root-room to such plants as *Justicias*, *Clerodendrons*, and *Erythrinas*, and to promote vigorous growth, water once or twice a week with weak liquid manure; give plenty of water at the roots; syringe often, and keep the floors and every part damp, to assist in rendering the atmosphere almost constantly humid. In the *Orchid* house, liberal and frequent waterings, are indispensable for all species from the more humid parts of the tropics, especially from the East Indies, as *Dendrobiums*, *Vandas*, *Stanhopeas*, *Gongoras*, &c. Those requiring the same treatment as *Cattleyas*, should either be placed in another house by themselves, or, if that is not convenient, at the cool end of the same house as the others, where also they will receive much less water. All such kinds as will flower during the winter season, should have their growth perfected as speedily as possible, and then be gradually withdrawn from exciting influences, and placed in cooler and more favourable situations, for maturing their bulbs and stems, and permitting them to sink into a state of rest.



S. Holden del & Lith.

Cymbidium eburneum.

CYMBÍDIUM EBÚRNEUM.

(Ivory Cymbid.)

Class.
GYNANDRIA.

Order.
MONANDRIA

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

GENERIC CHARACTER.—*Perianth* coloured. *Sepals* and *petals* nearly equal, free. *Lip* sessile, free, without a spur, concave, sometimes articulated with the base of the column, sometimes slightly connate, undivided, or three-lobed. *Column* erect, semi-cylindrical. *Anthers* two-celled. *Pollen-masses* two, often two-lobed at the back.

SPECIFIC CHARACTER.—*Plant* an epiphyte. *Leaves* ensiform, narrow, rigid, terminating obliquely with two acute lobes. *Racemes* two-flowered, decumbent, clothed with long acute scales. *Sepals* oblong-lanceolate, fleshy, waved at the edges, acute. *Labellum* three-lobed, with a long yellow stripe extending from the base along the middle to nearly the tip; middle lobe triangular, curled; two lateral lobes rounded.

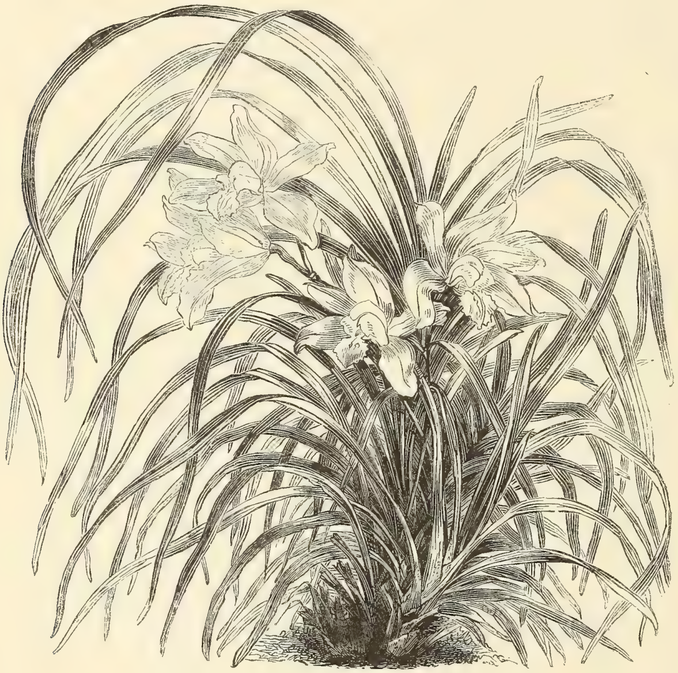
THIS fine species of Cymbidium is a native of the East Indies, from whence it was imported by Messrs. Loddiges of Hackney, in whose nursery it flowered in May, 1848, when our drawing was prepared.

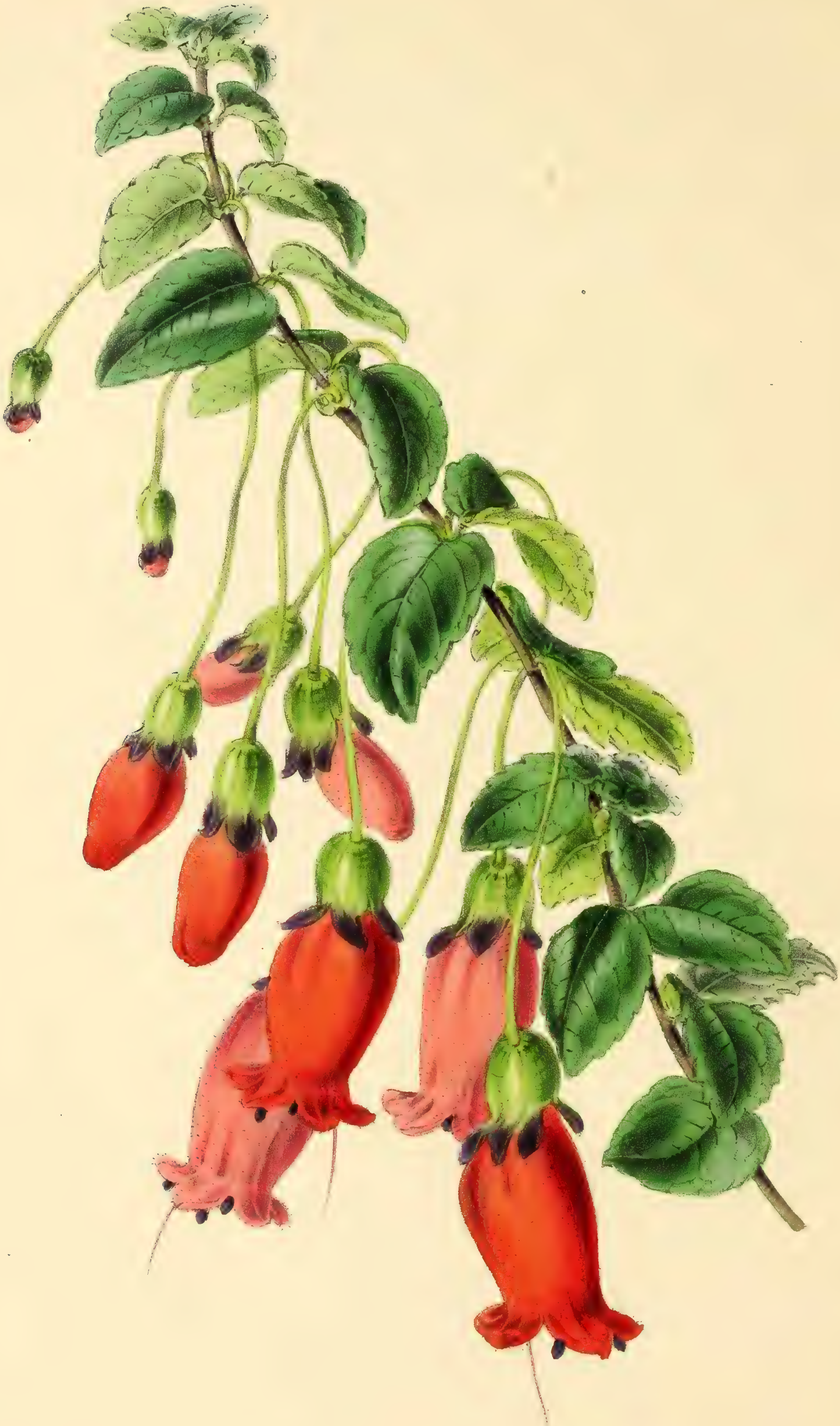
How admirable are all the works of the great Creator! and how much we may find to admire even in the peculiar forms, exquisite fragrance, and rich colours of the flowers of Orchids; yet how small a portion of the vast creation do these singular plants comprise—merely one link in the great chain of the vegetable world. Thirty years ago, hundreds of the beautiful forms which now adorn our orchid-houses, were to Europeans utterly unknown; and even at a much later day, the existence of many was considered problematical, and the reports of travellers either mistakes or exaggerated, to excite wonder; but time and perseverance have torn down the veil, indefatigable botanists have explored the wilds of India, and splendid species whose flowers exhibit almost every variety of form, colour, and perfume, have been discovered and described; and successive collectors still continue to add brilliant gems to our already extensive stock, amongst which the subject of our present plate, although less conspicuous than some others, holds by no means an unimportant position.

The flowers are large, of a pure and delicate white, with the exception of the yellow stripe on the lip, and being fleshy and shining resemble ivory, whence the specific name. They also emit a powerful and very pleasant fragrance. The species approaches most nearly in habit to *C. Mastersii*, and like that species, and all others of a similar character, appears to flourish with the greatest vigour planted in pots, in a porous peaty earth full of fibrous matter; or where peat of a sufficiently open texture cannot be conveniently obtained, it must be rendered so by intermingling with it pieces of decayed wood, charcoal, potsherds, and hypnum moss; for this is one of the most essential requisites in the soil, or other material employed for Cymbids.

Kymbe, a boat, is the origin of the generic appellation, and applies to the form of the lip.

The accompanying wood-cut represents the habit and general appearance of the plant when in flower.





S Holden. del & Lith

Mitraria coccinea.

MITRÀRIA COCCÍNEA.

(Scarlet-flowered Mitraria.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.
(Gesner-worts, *Veg. King.*)

Generic Character.—*Calyx* inferior; limb five-parted, equal, calyculated by a two-lobed, mitre-formed bractea. *Corolla* tubularly ventricose; upper lip of limb two-lobed; lower one three-lobed. *Stamens* four, didynamous, exserted, with the rudiment of a fifth behind. *Anthers* free. *Berry* one-celled, many-seeded.—*G. Don.*

Specific Character.—*Plant* a shrub. *Stems* climbing. *Leaves* opposite, small, ovate, acute, serrated. *Flowers* axillary, solitary. *Peduncles* slender, about two inches long. *Bracts* mitre-formed, covering the calyx. *Calyx* five-parted. *Corolla* of a brilliant scarlet; tube ventricose, an inch-and-a-half long; limb bilabiate, upper lip with two rounded lobes; lower lip three-lobed, lobes smaller than the upper ones. *Stamens* four, exserted.

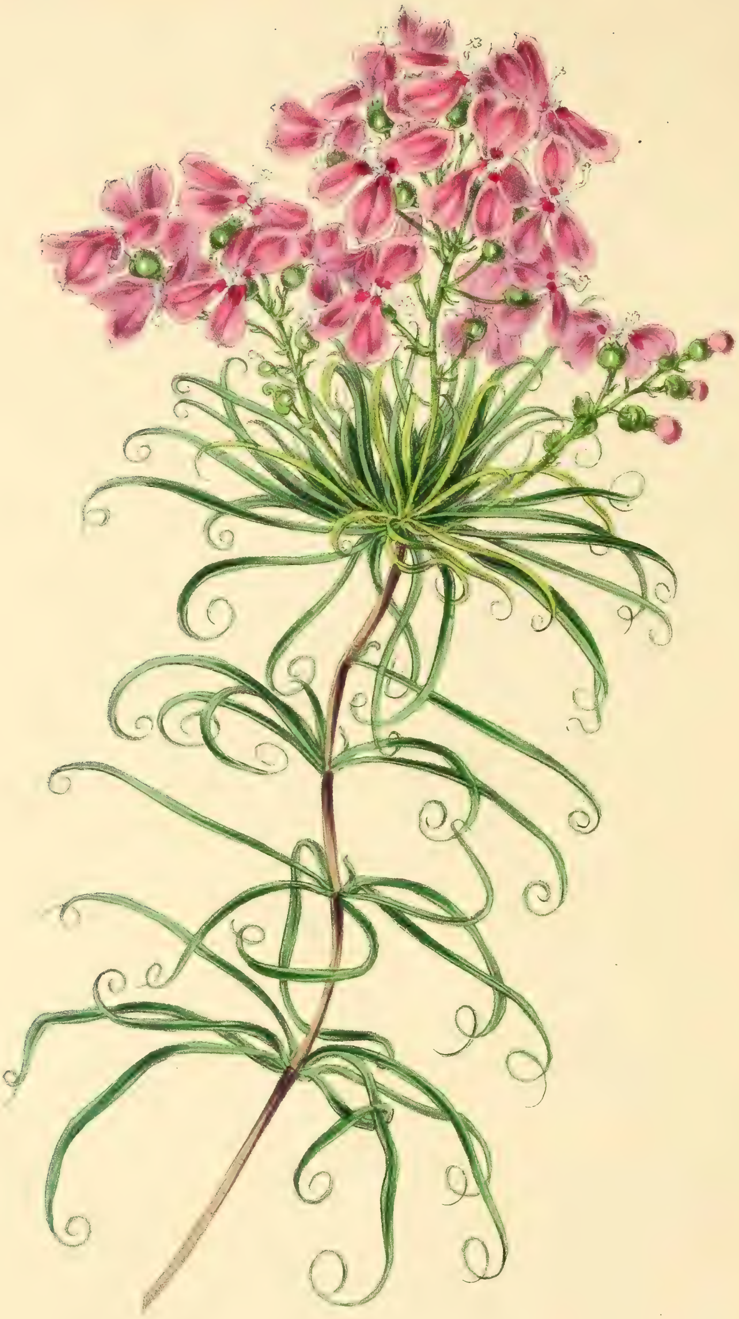
This is a most ornamental climbing shrub, having the habit of *Columnea.* It is a native of San Carlos de Chiloe, and was introduced by Messrs. Veitch and Son, of Exeter, who received it from their collector, Mr. Lobb, and in whose nursery it flowered in May last, when our drawing was made.

The plant seems likely to prove a valuable acquisition to our gardens; its habit is scandent, and it appears to grow about the height of three or four feet; the leaves are small and neat, and the flowers, of a vivid scarlet, hanging gracefully on long, slender peduncles from the axils of the leaves, give it when in bloom a more than ordinary share of attraction; and what is not the least valuable and remarkable is, that it will very probably prove perfectly hardy, being the only member known of this extensive and very ornamental order that will endure the open air of this country without protection; the greater part being amongst our tenderest stove-plants, and the others requiring the warmth of a greenhouse.

This genus, *Mitraria,* was founded by Cavanilles; the name being derived from *mitra,* a mitre, in reference to the mitre-formed bractea which covers the calyx; and is a very different plant from the *Mitraria* of Gmelin, which is a *Barringtonia.* The subject of our present plate is the only species at present known, although it is not improbable but subsequent collectors may yet meet with other, and perhaps still more valuable, members of so beautiful a genus.

The cultivation is easy. If the plant be grown in a pot, lay abundance of broken crocks at the bottom for drainage; and for the soil, use a mixture of two parts leaf-mould, one part light, rich loam, and one part peat; but if it is planted in the flower-border, any light, rich earth, or good vegetable mould will suit it well.

Increase is effected by cuttings of the half-ripened wood, planted in pots of sand and placed under a hand-glass.



S. Holden, del & Lith.

Stylidium scandens.

STYLÍDIUM SCÁNDENS.

(Climbing Stylidium.)

Class.
GYNANDRIA.

Order.
TETRANDRIA.

Natural Order.
STYLIDĬACEÆ,
Style-worts (*Veg. King.*)

Generic Character.—*Calyx* bilabiate. *Corolla* irregular, five-cleft, the fifth segment or *labellum* dissimilar, small, turned downwards, or very rarely extended forwards. *Column* reclinate, with a double bend. *Anthers* two-lobed; lobes spreading. *Stigma* obtuse, undivided. *Capsule* two-celled.—*R. Brown.*

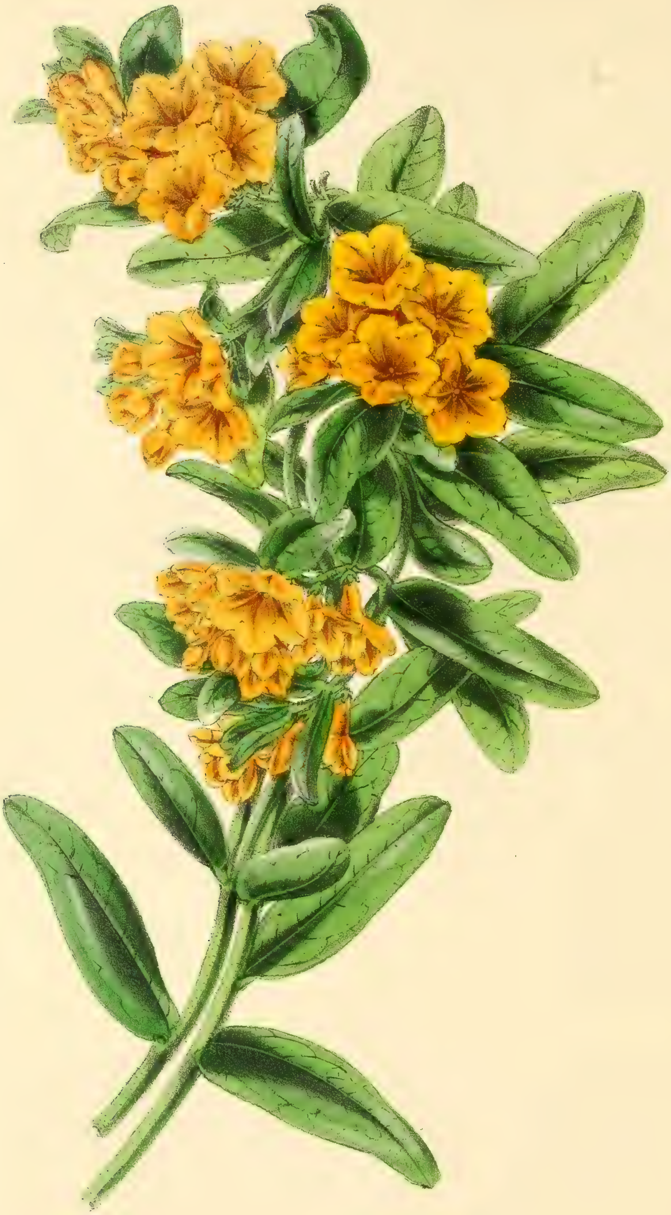
Specific Character.—*Root* perennial. *Stem* eighteen inches high, slender, shining, red, glabrous, branched. *Leaves* three inches-and-a-half long, whorled, crowded, linear, channelled, mucronate, rolled back at the apex in form of a cirrhus, throwing out long, filiform, single, unbranched, red and shining roots from their axils. *Bracteæ* green, adpressed, one between each pedicel, and two nearly opposite above its middle, the former small, ovate-acuminate, or larger and subulate, the latter very minute and scale-like. *Corymbose racemes* erect, clustered at the extremities of the branches. *Pedicels* three to nine lines long, spreading, single-flowered, red, glabrous, filiform. *Calyx* superior, bilabiate, two to three-partite, green, glabrous, adpressed, segments elliptical, with paler edges, ciliated. *Corolla* about ten lines across, monopetalous; tube epigynous, nearly colourless, twice the length of the calyx; limb five-partite. *Labellum* pale, reflected, ovate, acute, fringed with glandular hairs, auricled, auricles spreading, very slender, subulato-filiform, rose-coloured, twice the length of the labellum, with a few glandular hairs near the bases, under a high magnifying power appearing rough and serrulate; other segments of the corolla, lilac, and imbricated in the bud, afterwards rose-coloured, paler below, darker in the throat, spreading or slightly reflected, obovate, sparingly ciliated, crenate at the apex, the two next the labellum crowned with an erect, generally emarginate, subspathulate scale, the two others naked. *Column* terminal, reflected over the labellum, and irritable, flat, white at its base, lilac in the middle, yellow towards its extremity, and there especially, but slightly also on its upper surface, glanduloso-pubescent. *Anthers*, after bursting, brownish-yellow, surrounded by a tuft of shining, transparent, at length yellow pubescence, bilobular, lobes divaricating, elliptical, pointed at the lower extremity, bursting along the front. *Stigma* in the centre between the anthers, green, at first hidden and small, but afterwards much enlarged, capitate and raised upon a conical neck, pubescent. *Germen* green, becoming reddish-brown when ripe, ovate, glabrous, unilocular; ovules placed on a round central receptacle, having the mere rudiments of a dissepiment at its base. *Sir W. Hooker, Bot. Mag.* 3136.

For the opportunity of figuring this well-known but pretty species of *Stylidium*, we are indebted to Messrs. Low and Co., of the Clapton Nursery, London, where it flowered in June, 1846, when a specimen was furnished to our artist.

About forty-five species of this singular and elegant genus are known to botanists, all natives of New Holland, Van Dieman's Land, and different parts of Australia, where they grow abundantly on open sandy plains, fully exposed to the sun, but where the soil beneath is wet and spongy. About thirty kinds have been introduced, all of small stature, and although the blossoms are not very conspicuous or showy, yet all are pretty and interesting, and the most part are produced in racemes, but a few appear in spikes and corymbs. The prevailing colours are rose and pink in various shades and degrees.

S. scandens was originally introduced to this country in 1830, by Col. Lindsey, who discovered it growing in King George's Sound, and communicated seeds to the late Lord Blantyre, which were by him furnished to the Botanic Garden, Edinburgh. It has since been frequently introduced, and is now found in almost every collection of plants. It flowers profusely with but little care and attention, being well worthy of a place in every greenhouse. For the particulars of cultivation refer to the "Magazine of Botany," vol. xiv., p. 163.

The generic name is derived from *stylos*, a column, in reference to the stamens and style being combined into a column.



S. Holden del. & lith.

Batschia canescens.

BÁTSCHIA CANÉSCENS.

(Canescent Puccoon.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
BORAGINÀCEÆ.
(Borage-worts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* five-cleft. *Corolla* salver-shaped; tube longer than the calyx, bearded by a ring of hairs inside at the base; mouth naked. *Anthers* inclosed. *Nuts* four, one-celled, ovate, smooth, shining, fixed to the bottom of the calyx, imperforated at the base.—*Don's Syst.*, 4, 326.

SPECIFIC CHARACTER.—*Plant* an herbaceous perennial, every part covered with a hoary downiness. *Stems* erect, divided towards the top into two leafy racemes. *Leaves* linear-oblong, obtuse, emarginate at the top, when old, scabrous. *Flowers* nearly sessile, produced in short, terminal, bracteate, almost fastigiate racemes; of a bright orange-yellow. *Calyx* five-cleft; segments linear, acute, rather short, of a pale-green. *Corolla*: tube twice the length of the calyx, pilous outside, mouth contracted by five obtuse gibbosities; limb five-lobed; lobes rounded, entire. *Stamens* five, seated in the middle of the tube of the corolla. *Style* one, longer than the stamens. *Ovary* four-lobed.

AUTHORITIES AND SYNONYMES.—Batschia *Michaux, Flor. Bor. Amer.*, 1, p. 133. *Don's Syst.*, 4, p. 325; Batschia canescens *Michaux, Fl. Amer. Bor.*, 1, p. 130; Anchusa canescens *Muhlenberg's Catalogue*, p. 19; Lithospermum canescens *Lehmann's Asperifol.*, p. 305; Anchusa virginiana *Linn. Syst.*, p. 191.

THIS pretty perennial is a native of Virginia, Carolina, and some other parts of North America, where it grows in light sandy soil, on dry and sunny hills. In height, it varies from one to two feet, according to the situation it occupies, and produces its rich orange flowers in profusion from May to July.

The roots of all the species of Batschia are covered with a red substance, and afford a beautiful crimson colour; that which is collected from our present species is the true *Indian Puccoon*, although the "Blood-root" (*Sanguinaria canadensis*) is commonly known as the *Puccoon* of Canada, but the colour obtained from it is very inferior to that supplied by the subject of our plate.

For the opportunity of figuring this rare and useful plant, we are indebted to Mr. Edward Leeds, of St. Ann's, Manchester, to whom it was sent, in the autumn of 1847, by Mr. John Goldie, who found it in Canada.

It is perfectly hardy, and, being a very free-flowerer, of a moderate height, and of the easiest management, may be included amongst the most useful of our border plants, requiring only a light, sandy soil, and a dry airy situation.

On a dry sunny bank where few other plants will thrive, this pretty perennial will flourish, and in rockwork it makes a very good appearance. That from which Mr. Leeds took the specimen from which we made our drawing, sent up seventeen stems, and exhibited a fine show of flowers, and probably the next year it may far exceed even what it is at present.

The generic name is given by Michaux in honour of J. G. Batsch, a German professor of Botany.

THEORY OF THE DEW.

(*Continued from page* 132.)

It should appear, from the third and latest letter of M. Melloni, that the editors of periodicals who inserted the series, had mistaken the writer's object. Certain it is that, judging from the style of his first epistle, we ourselves concluded that M. Melloni was perfectly satisfied with the soundness of Dr. Wells's theory, and therefore had adduced further experiments, in order to "make assurance doubly sure." It now, however, appears that such was not the case; we shall therefore recur to Dr. Wells himself, in order to put the reader in possession of several interesting facts that were not alluded to in the last article.

1. "After a long period of drought, when the air was still and the sky serene, at twenty-eight minutes before sunset, parcels of wool and swansdown, previously weighed, were exposed to the sky upon a smooth, unpainted, and perfectly dry fir table, five feet long, three broad, and nearly three feet high, which had been placed an hour before in the sunshine, in a large grass field. The wool, twelve minutes after sunset, was found to be 14° colder than the air, but it had acquired no weight," (hence, was not wetted with dew). "The swansdown, much greater in quantity than the wool, was at the same time 13° colder than the air, and was also without any additional weight. In twenty minutes more the swansdown was 14½° colder than the neighbouring air, and was still without additional weight. At the same time the grass was 15° colder than the air, at four feet above the ground."

2. "A very slight covering will exclude much cold." Every gardener can bring this asserted fact to the test, and we urge it upon him so to do, in order to leave no doubt remaining upon a point of such practical utility. "Being desirous," says Dr. Wells, "of acquiring some precise information on this subject, I fixed, perpendicularly in the earth of a grass-plot, four small sticks, and over their upper extremities, which were six inches above the grass, and formed the corners of a square, the sides of which were two feet long, I drew tightly a very thin cambric handkerchief. The temperature of the grass, which was thus sheltered from the sky, was always found higher than that of the neighbouring grass, which was uncovered, if this was colder than the air. One night, when the fully-exposed grass was 11° colder than the air, the latter was 3° warmer than the sheltered grass; and the same difference existed on another night, when the air was 14° warmer than the exposed grass.

"A difference in temperature of some magnitude was always observed on still and serene nights, between bodies sheltered from the sky by substances touching them, and similar bodies which were sheltered by a substance a little *above* them. Dr. Wells found that grass sheltered by a cambric handkerchief raised a few inches in the air was, on one occasion, 3°, and on another 4°, warmer than a neighbouring piece of grass, with which the handkerchief was in contact."

In noticing these experiments, and the deductions at which Dr. Wells arrived, as we can perceive no reason materially to change the opinions we formed, and publicly announced several years ago, we now venture to present the same to the reader in a modified form. In reference to paragraph No. 1, the nature of the materials employed by Dr. Wells must be considered; they were dry wool and swansdown—both of them *electrics*, both non-conductors of electricity; they were placed upon a fir table, rendered insulating and a non-conducting medium, naturally by the resinous matter which sound fir contains, and still more so by the process of drying by exposure to the sun. Those electric substances, wool and swansdown, were thus insulated at an elevation of three feet above the surface of that grass which became 14° and 15° colder than a stratum of air four feet above the ground, and one foot above the table. Under those circumstances the swansdown remained dry, though cooled down to within half a degree of the grass, which, in all probability, was dewed, though we do not find it stated so to have been.

From the facts thus announced it should appear that such non-conductors do not receive the dew, however low their temperature may be; and therefore, that the precipitation of dew can neither depend upon the degree of cold, nor upon existing atmospheric moisture, independent of the agency of vegetable organisation, or pointed conductors of some kind.

No. 2. The effects produced by the slight covering of a cambric handkerchief, lead to inferences of great practical utility: glass coverings may be much improved by screens, raised an inch or two above them, so as to interpose a stratum of dry air, which always acts as a very imperfect conductor; and plants in the open air can be considerably defended by simple raised coverings; but while admitting the facts, we may be allowed to question the validity of the hypothesis, which refers the phenomena to the influence of radiated heat, active upwards, in the first place, and then downwards, as if by reflection. Again to cite Dr. Wells:—

" Dense clouds, near the earth, reflect back the heat they receive from it by radiation. But similarly dense clouds, if very high, though they equally intercept the communication of the earth with the sky, yet being, from their elevated situation, colder than the earth, will radiate to it less heat than they receive from it, and may consequently admit of bodies on its surface becoming several degrees colder than the air."

" The best radiators," said a public lecturer on heat, to his audience, "are soonest dewed; hence grass and vegetables are more quickly covered with dew than gravel stones and metals; and as the earth dissipates its heat by radiation, it will be seen that any light awning spread over the ground will prevent radiation, and keep the earth warm.

" This doctrine of radiation is the stumbling-block—it is, in fact, a mere name of an effect, for which no cause is assigned."

Let any of our observant readers call to memory the phenomena which usually prevail during a very hot and dry summer, wherein the state of the atmosphere was that of almost vapourless transparency, and the maximum temperature from 75° to 80°. At such a period, wherein evaporation must have been at its maximum, millions of tons of water would daily pass into the atmosphere without producing a diminution of its transparency. Yet so far from clouds or rain resulting from this measureless absorption of vapour, the dew itself was precipitated during the clearest nights in extremely diminished quantities.

Radiation takes place from heated surfaces into any cooler medium; thus, an iron steam-tube, passing through a vessel of water, will radiate or diffuse its heat among the particles of water which surround it. The hot-water pipes of a forcing-house will radiate heat into, and warm the atmosphere of the building; but this radiation will not produce any phenomena which can elucidate the theory of dew. A basin or striking-glass, inverted, will receive moisture from the surface of the ground, covered with herbage, and exhibit it in the state of condensed water-drops; but it will do the same and produce the same results when placed on the surface of hot, sandy, and parched ground. Radiation, so viewed, is little else than another term for evaporation or the evolution of steam. But the radiation of our theorists is referred to the agency of vegetable organised bodies, as if it were the result of some faculty they possess of conducting and carrying off heat from the surface of the earth, and from their own organisation, till reduced to a degree of temperature much lower than that of the surrounding air.

But do not the advocates of this hypothesis overlook the organic structure of plants, and the peculiar conductive powers with which they are endowed? A tuft of grass, presented with its pointed extremities to the prime conductor of an electrifying machine, or to the ball of a charged jar, will draw off the charge silently; hence, we may safely conclude that herbage attracts and neutralises the electricity of the atmosphere around it. We must admit that the air abounds with watery vapour; and this very admission implies the repulsion of the particles by some energetic natural agent. What, then, is that agent? The inquiry is of deep interest; but analogy appears to furnish the ready answer. It should appear that the vegetable creation is destined to perform some of the grandest functions of nature, by connecting the energies of the great agents, solar-light, air, water, and earth. If we investigate the structure and uses of the leaves and their serratures—of thorns, bristles, and prickles—of the sharp divisions of sepals, petals, and the fructiferous organs of flowers, we may perceive, by copious induction of facts, that grass, herbage, shrubs, and trees—those "best of *radiators*," which are "the soonest dewed"—constitute, in fact, an assemblage of so many conducting points—a series of the most perfect conduits of natural electricity, which not only maintains the intercourse between the earth and its atmosphere, but, in so doing, promotes and effectuates the attraction, distribution, and elaboration of all the vegetable fluids. Can the phenomena of the dew—that is, the condensation of atmospheric moisture—be otherwise more clearly elucidated? And why should trees and herbage condense so great a volume of water? Why should ground, newly dug, be covered with hoar-frost, when hard, unwrought earth close to it, shall be free from any particle of rime, unless where some stray weed, projecting point, or piece of chalk, and the like, may project from the surface? Let us admit that these substances become dewed by the agency of radiation. Yet, what then? Is radiation anything more than an effect produced by that active cause which governs every phenomenon of attraction and repulsion? If vegetables be, in fact, vehicles for electric currents—if the flow and direction of their vital and secreted fluids be caused by the influence of those currents, then may we philosophically infer that the radiating power of plants, and their covering dew, must depend upon the instrumentality of that agent which is ever present in the atmosphere, can be detected and measured by our instruments, and is known to induce those meteoric changes that are in perpetual operation throughout the aërial ocean.

We know that atmospheric moisture is maintained in a state of vapour by a repulsive power. Electricity—or call it ethereal elementary fire—exists in two states, plus and minus—positive and negative; each condition or axis of power being repulsive of itself, but exerting attraction on particles of an opposite power. The moisture of the atmosphere may be either positive or negative, and, in either case, it exerts, by induction, an opposite condition on all bodies within the sphere of its influence. We are ignorant of prime causes—what electricity is we know not; but yet, philosophers have been enabled to appreciate some of its laws.

Whenever, therefore, the electrised vapours meet with a series of vegetable points in an opposite state of electricity, the two conditions must act upon and neutralise each other, and cause the deposition of those aqueous particles, which, till then, had been held in a state of repulsion, and of infinitely minute division.

If these views be correct—and as yet they have not been shown to be unphilosophical—the deposition of the dew may be considered an electrical phenomenon.

CULTURE OF THE MANGO.

THE Mango, *Mangifera indica* of our Botanical Catalogues is the *Mangifera Amba* of Forsk. Descrip. 205; and the *Mangifera domestica* of Gært., Fr. It is a native of the East Indies, whence it was introduced in 1690, and is associated with the Natural Order *Terebinthaceæ*, because of the turpentine flavour which most of these plants possess.

In its native country it forms a tall spreading tree, in shape not much unlike a Walnut-tree, but when in flower it might, at a distance, be mistaken for a Spanish Chestnut. The *wood* is brown and inferior. The *leaves* are entire, feather-nerved, oblong-lanceolate, stalked, seven or eight inches long, and two or more broad, of a fine strong green, and growing in bunches at the extremities of the branches. *Flowers* in loose, terminal, erect panicles, polygamous. *Calyx* five-parted, deciduous. *Petals* four or five, spreading at the top, white, streaked with yellow. *Stamens* five, four of which are usually barren. *Style* one. *Drupe* kidney-shaped, smooth, somewhat compressed, containing a woody fibrous nut; when ripe, the leathery crustaceous coat or skin is yellowish-green, tinged with red, and sometimes speckled with black; the flesh is orange-coloured, soft and pulpy, and replete with a fine aromatic juice. *Seed* ovate-oblong. The plant is a native of the East Indies, and is extensively cultivated in every part of the world within the tropics; the fruit is esteemed very wholesome, being quite equal to a well-grown and fully-ripened peach. Gentlemen there, eat scarcely any other fruit during the hot months. And also whilst in an unripe state they are formed into jellies, tarts, preserves, and pickles. The varieties are almost innumerable, scarcely two trees in a large plantation bearing exactly the same shaped fruit; some are round, others oblong; others, again, are kidney-shaped, (which is the prevailing form); some differ in colour, others in the flavour and consistence of the pulp, and perhaps there is as great a variation amongst Mangos, as amongst the apples and pears of our own country; the flesh of many of those grown in the East Indies is stringy, and when cut or much handled, the juice oozes out, and the fruit becomes insipid; others, however, are melting, and separate freely from the stone; these latter are the kinds chiefly cultivated in the West Indies, and are in all countries by far the most esteemed. They cut nearly as solid as an apple, but contain more juice, and have a flavour altogether different; some are as large as a man's fist, but the most common size is that of a golden pippin apple. The kind known in Barbadoes as the Peach Mango, is perhaps the best; the sub-varieties of it are numerous; and all exceedingly good. They have a peculiarly rich, sweet-perfumed flavour, accompanied with a very grateful acidity, a melting flesh, and are exceedingly juicy.

Mangos are considered by Europeans amongst the most delicious of all tropical fruits, and during the hot months are rarely absent in a ripe state, from the tables of the gentry of Hindostan.

The tree is most ornamental, growing from fifty to seventy feet high, and continues blooming in succession from June to September; in Brazil it is stated by travellers to be planted along the streets of their towns, where the majestic wide-spreading branches and dark green foliage, afford a grateful shade during the season of most powerful heat.

The wood of all the species is porous, soft, and of little value, except for the fire, which is the chief use to which it is applied; persons of distinction generally add a small portion of sandal-wood, which in connexion with the smell of turpentine diffused from the Mango-wood, gives a very pleasant perfume to the apartments. The wood of *M. fœtida* is, however, sometimes used for flooring and a few other common purposes; it is generally seasoned by first soaking the logs in water, and then exposing them to be well dried; being, however, of such short duration, it is lightly esteemed.

The bark of the common Mango, especially that from the root, is made use of in medicine, as are also the seeds and leaves. The bark is bitter and aromatic, and thought to be useful in cases of diarrhœa, and leucorrhœa; the seeds are reputed to possess anthelmintic powers, and the leaves relieve the tooth-ache.

Besides the common Mango several other species of *Mangifera* deserve the attention of cultivators; for although the fruit of no other species is so good as that of the one previously described, yet the different kinds are more or less prized in the countries where they naturally grow, and would probably, by cultivation, be fully equal to many of the common fruits of our gardens at present grown. Amongst these may be selected—

The Lukshmee (*Mangifera sylvatica*).—This forms in Silhet a tree nearly as large as the common Mango; the *leaves* are large, alternate, lanceolate, and of a deep glossy green. The *flowers* are produced in terminal panicles, and have only one fertile *stamen*. The *fruit* is smooth, obliquely conical, in appearance not unlike a small-sized common Mango, and although possessing few of the good qualities of the common kind, is yet eaten by the natives, and considered nutritious and wholesome. It is also used in Medicine.

The Manga-utan (*Mangifera glauca*).—A native of the Moluccas, where it forms a tree about the same size as the last; the *leaves* are large, oval, and tapering to both ends, of a blue green beneath, and placed thinly on the branches. The *panicles* are terminal and short. *Fruit* about the same size as the *Lukshmee*, and much like it in flavour.

The Long-fruited Mango (*Mangifera macrocarpa*) is a native of Java, and grows to the height of sixty feet or more. The *leaves* are long, linear-lanceolate, on long petioles, and are scattered thinly on the branches. The *panicles* of flowers are terminal, and the *fruit* is long, and somewhat kidney-shaped. *Pulp* sweet, with a slight acid; very inferior in flavour to the common Mango.

The Meriam or Gandaria (*Mangifera oppositifolia*).—This kind forms a shrub which sometimes reaches the height of thirty feet, but more commonly it is seen not higher than fifteen feet. It is a native of Java and Pegu, where it is cultivated for the sake of its fruit. The *leaves* are opposite, on short petioles, lanceolate, and tapering towards both ends. *Panicles* short, both terminal and axillary. *Flowers* pale yellow. *Stamens* five, of which four are usually fertile. *Fruit* pale yellow, smooth, compressed, about the size of a small golden pippin apple, but different in form. It is universally eaten in Burma, and much esteemed.

The generic name *Mangifera* is derived from *Mangha* or *Manghos*, the native name of the fruit, and *fero*, to bear.

In cultivating the above species the same general treatment may be given to all. Some of the varieties of the common Mango have already fruited, both in this country and on the European continent, and the fruit proving of a first-rate quality, it certainly deserves the best attention of cultivators.

With respect to soil, it may be worth remarking that in all tropical countries the finest trees, and best flavoured fruit, are always to be met with in districts where the soil is deep, light, and somewhat sandy: this knowledge may serve as a guide in this respect. If the plants are grown in pots or tubs, a mixture of two parts light rich turfy loam, and one part peat, sand, and rotten manure mixed, is the best soil, with abundance of drainage; but if they are turned out into a prepared border, any light rich turfy loam, rendered open by an addition of sand, will answer every purpose.

The general temperature in those countries where the plants naturally grow, range from 60° to 90°; with us, during the most vigorous growing season, they require an average heat of 75°, with a humid atmosphere; in the dry season, 70° with a moderate moisture; and in winter from 50° to 55° with a dry and airy situation.

Whilst the plants are in vigorous growth, water with weak liquid manure, made from sheeps' droppings, and continue to supply this whilst the fruit are swelling up. Syringing also is very important whilst the wood is forming, and the fruit small, but this must be discontinued when the plants are in flower, the fruit are ripening, and in the period of torpidity.

Air should be supplied liberally when the weather is sufficiently fine to admit of it: even in winter this is desirable.

Although Mango trees do not flourish in bottom-heat, yet if grown in pots or tubs it is generally thought advantageous to plunge them, either in old tan or earth, for otherwise they sometimes fail to set a good crop of fruit. Some persons, however, are very successful, who leave the pots standing on the surface; perhaps in this latter situation more attention is required to prevent any sudden alternations of heat and cold, drought and moisture, reaching the roots, which would effectually check the progress of the crop.

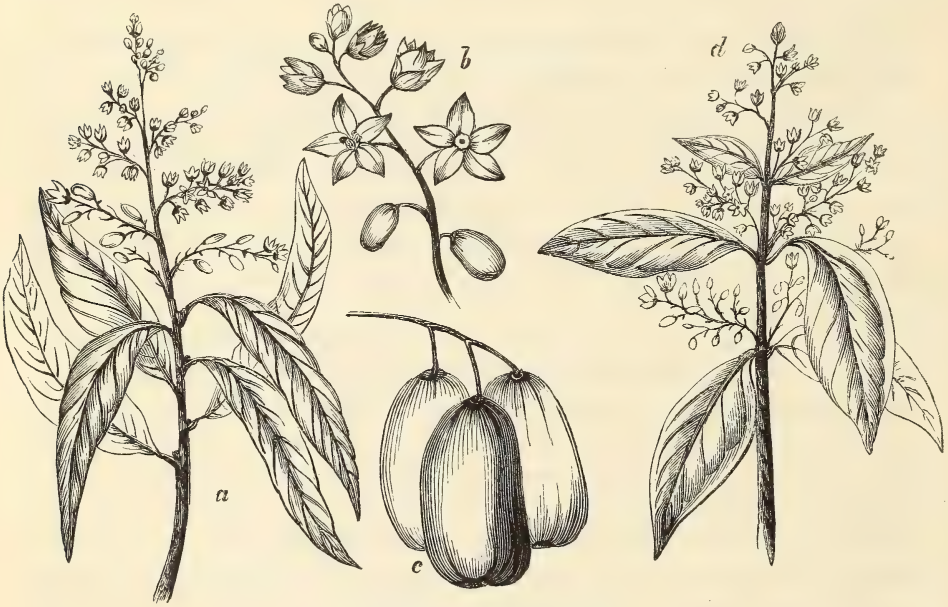
A very moderate share of attention only is required to grow these plants to perfection. When they have attained about the height of four feet, they may be considered sufficiently large to bear fruit; introduce them in spring to a brisk moist heat, to insure a good growth; when the shoots are formed, remove them to a more moderate heat, with less moisture, to mature their wood; and afterwards keep them in a cool place through the winter.

During the winter and before growth commences, pick off the terminal buds from the strong-growing branches, to induce them to send out side-shoots, and make the plants dwarf and bushy. Pruning with a knife should never be resorted to; the branches which are cut bleed so profusely when the growth commences, that the usual vigour and health of the plant is greatly weakened.

In the following March, shortly after the plants are introduced into heat, they become covered with a profusion of flowers. These should be fertilised, otherwise the fruit often sets thinly; those which do set, however, usually swell off pretty freely. About four good fruit on a panicle are quite sufficient to leave: more would scarcely arrive at maturity. Two or three weeks previously to the fruit ripening, no perceptible difference is observed in their size ; at length they slightly change colour, become tinged with brown, and have a pleasant fragrant smell.

The points of importance connected with the above details of culture are the following :—

1. To give a healthy, vigorous growth during the summer.
2. To remove when the wood is formed to a moderately hot atmosphere, not too moist, to allow of the young branches being perfected.
3. Dwarfing the plants, by picking off the terminal buds, so as to render them spreading and bushy.
4. To give a dry and airy atmosphere during the time the plants are in flower, and the fruit ripening.
5. Artificial fertilisation.
6. To give a cool and dry temperature during the winter.
7. Watering with liquid manure during the growing season, and whilst the fruit are ripening, and frequently syringing whilst the young wood is forming.



DESCRIPTION OF THE WOODCUT.

a Mangifera indica, or Common Mango, showing the panicle of inflorescence.

b Part of a panicle of flowers.

c Fruit, of the form it assumes when full-grown.

d The Meriam (*Mangifera oppositifolia*).

Propagation is effected by seeds, cuttings, layers, and by grafting. The *seeds* are sown in pots of light soil, and plunged in heat. *Cuttings* are made of the fully ripened wood, which should be planted in pots of sand, covered with a glass and plunged in heat. *Layers* are branches layed in the soil or in pots without any incision being made, and require no other preparation than the separation of the leaves from the part to be placed beneath the soil. In tropical countries all the fine kinds are said to be increased by grafting, but with us grafted ones are short-lived, and are long before they flower; indeed, all the kinds which have fruited in our stoves are seedlings, the engrafted ones sometimes die suddenly without any apparent cause.

SPIKENARD.

Spikenard, or Nard, is an odoriferous plant which was highly esteemed by the ancients, but of which they have given so vague and imperfect a description, as to render it exceedingly difficult to point out with certainty the particular species to which the name was applied. Pliny, in describing it, says:—The blossoms of the Nardus are produced in spikes, are very fragrant, and sell for 100 denarii per pound, being used in wardrobes to give an agreeable perfume to clothing; and that, both from these and the aromatic leaves, a very precious ointment was prepared, which was usually kept in small boxes made of alabaster, or some other valuable material, and constituted an important article in the toilets of the great. The *Syrian* kind was considered the best, and next to that the *Gallic*. The former grew abundantly in the neighbourhood of the city of Eporrhedia, from which the inhabitants obtained a revenue, equal to that derived from a mine of the most precious metal. He also distinctly notices the Nardus of Candia, and India, but does not mention them as the plants from which the Spikenard ointment was made.

Pliny's remarks on the uses made of the flowers and leaves of the *Nardus*, seem to apply mainly, if not altogether, to the Lavender (*Lavandula spica*) which plant was perhaps known to the Greeks by the name of Nardus, because their supplies were chiefly derived from Naarda, a city of Syria, near the Euphrates, and if so, we can easily account for the Romans having it under that appellation.

The name *Lavender* is not very ancient, and is perhaps derived from *lavo*, to wash,—because the plant was used in baths on account of its fragrance. It is a native of Languedoc, some parts of Spain, Hungary, and Austria, and was much cultivated in Syria about the time of the Christian era. The Romans also called the plant *Asarum*, because the leaves were too small and brittle to be used in garlands and coronets.

It is not improbable but this plant was also alluded to by Theophrastus, under the name of *Cneoron leukon*, but of this nothing certain can now be ascertained.

However high a value might have been set upon Lavender, we can scarcely believe it to be the true Spikenard of the ancients; the ease with which it could be increased and cultivated, especially in so fine a climate as that of Syria, must in a few years have rendered it so common, that the price would have been lowered in proportion.

Now, from the extraordinary high rate at which the article sold, namely, three hundred pence (about £9 7*s.* 6*d.*) for a small alabaster box of the ointment (Mark, c. xiv., v. 3—5), it would appear more probable that the true Spikenard must have been imported at considerable expense and trouble from some far-distant land, instead of growing plentifully in the immediate neighbourhood.

The late Sir William Jones, in two interesting papers inserted in the "Transactions of the Asiatic Society," has advanced many and good reasons to show that the ointment of Spikenard is not prepared from Lavender, but from a Valerianaceous plant, a native of the Himalayan Mountains of India, whence it is imported for that purpose.

Many objections have been advanced against Sir William's opinion, because it is well known the fragrance of all Valerianaceous plants is by no means agreeable to Europeans; yet Eastern nations appear to differ widely from us in this respect, as the roots of *Valeriana celtica* (*d*) and *V. Saliunca* are procured from the mountains of Austria, at considerable cost, to aromatise their baths, and form an ingredient in their finest perfumes.

The roots of many kinds are valuable in medicine, *Valeriana officinalis, V. Phu,* and *V. celtica,* are tonic, bitter, aromatic, and antispasmodic. *V. Dioscoridis,* which is probably the *Phu* of Dioscorides, acts as a very powerful stimulant, producing intoxication, and in large doses convulsions and death. *V. Sitchensis,* a native of North America, is perhaps the most powerful of all. They possess these properties, however, in a much less degree when grown in low, wet situations.

The odour of all the Valerians is very grateful to cats: they will bite the roots, roll upon them, and appear for a time spell-bound and intoxicated under the influence. Rats are also attracted in a similar manner; the roots are therefore used by rat-catchers, in the same manner as they use oil of aniseeds, and the same effects are said to be produced.

The plant now generally believed to be the true Spikenard of the ancients is small and slender, rising from 6 to 10 inches high, growing abundantly on the Himalayan Mountains, upon projecting rocks, near to the regions of eternal snow, where it is obtained with great difficulty and danger by the peasantry, who collect and sell it to merchants trading to Turkey and Egypt. It has been named by botanists—

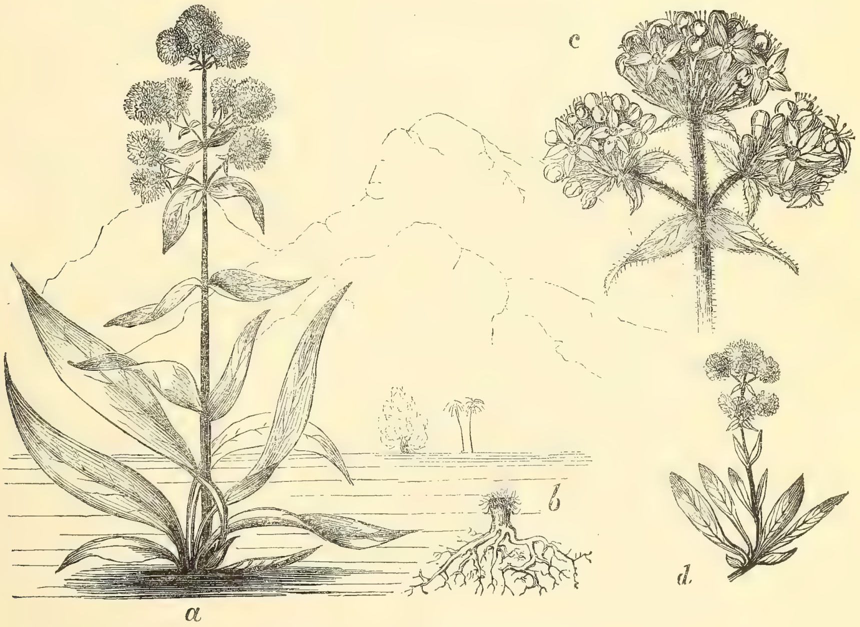
Nardostachys jatamansi (derived from *nardos,* a shrub, and *stachys,* a spike). It is the *Valeriana Jatamansi* of Sir W. Jones's "Asiatic Researches," vol. ii., p. 405, and vol. iv., p. 109, and Roxburgh's "Asiatic Researches," p. 451. The *Valeriana spica* of "Vahl. Enum.," 1, p. 13. *Patrinia Jatamansi* of Don's "Prodromus Flora Nepalensis," p. 159. *Nardus Indica,* J. Bauh. "Hist.," iii., p. 202. *Jatamangsi* of the natives of India. The *Nardostachyon, Spica nardi, Nardus Gangites,* and *Nardus Syriaca* of the ancients.

Description.—An herbaceous perennial. *Roots* simple, perpendicular, fleshy, very fragrant, with a multitude of slender fibres about the collar, four to six inches long. *Stems* simple, villous. *Leaves* entire, downy; radical ones oblong-lanceolate, very long; cauline ones sessile, sub-lanceolate, broadest at the base. *Flowers* disposed in fascicled corymbs. *Fascicles* opposite, pedunculate, and terminal. *Pedicels* and *ovary* tomentose. *Calyx* five-parted; lobes triangular-ovate, acute, short, foliaceous, somewhat denticulate, persistent, hairy. *Corolla* purple, tube dilated; limb five-lobed, somewhat unequal; lobes blunt; throat bearded. *Stamens* four, exserted, adnate to the tube of the corolla. *Filaments* bearded. *Style* longer than the stamens. *Stigma* simple, capitate. *Capsule* three-celled, crowned by the calycine lobes.

In habit it greatly resembles *Scorzonera humilis*, is a native of Nipaul on the Himalayan Mountains and Gogainsthan, in Mandor, and Chiton provinces, and in the provinces of Delhi, Bengal, and Deccan—growing in company with *Triplostegia glandifera*. The fragrance of the roots in some degree resembles that of *Valeriana officinalis*, but is far more aromatic and pleasant. The natives make use of them in medicine, as a remedy in hysteria and epilepsy.

The plant is nearly hardy, but may require a little shelter in winter, after the tops have died down, either by laying some extra soil upon the crown, or by turning a flower-pot over it.

Any light sandy soil will do, but if it be cultivated in a pot a mixture of peat, loam, and sand is the best.



DESCRIPTION OF THE WOOD-CUT.

a Nardostachys Jatamansi, or true Spikenard.
b Distorted root of Ditto.
c Detached corymb, natural size.
d Valeriana Celtica.

It is increased by seeds the most readily, but cuttings of the stems immediately when they have done flowering, strike freely if planted under a handglass on a warm shady border. The roots may also sometimes be divided at the crown, but this cannot often be done on account of their carrot-like form.

In a dry and sheltered situation it will make a very good border flower; but answers better on artificial rock-work. It is not however a showy plant.

The growth is slender, seldom exceeding seven or eight inches, and often not more than four or five.

Another species of *Nardostachys*, the *grandiflora*, has also been discovered; it is a native of Nipaul, in Kamaon: and is the *Fedia grandiflora* of Wallich's MSS. This is an herbaceous perennial, growing about six inches high, with fleshy *roots*, having a powerful fragrance similar to the true Spikenard. The *stem* is quite smooth. *Leaves* oblong, glabrous, radical ones long, cauline ones ovate or cordate. *Fascicles* of flowers solitary, terminal. *Bracts* three-nerved, membranaceous, oval, longer than the capsule. *Calyx* five-lobed, lobes denticulated. *Corolla* purple. *Capsule* downy.

Although the roots of *N. grandiflora* are perhaps not equal in fragrance to *N. Jamatansi*, yet they are most likely used for similar purposes.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE "BOTANICAL MAGAZINE" AND OTHER LEADING PERIODICALS FOR JUNE AND JULY.

Acacia argyrophylla—*Silver-leaved Acacia.* This species is one of the many novelties sent by Mr. Drummond from the Swan River Settlement, and is no less beautiful in the foliage (phyllodia,) than in its copious large heads of deep yellow flowers. The phyllodia are like the leaves of *Podalyria sericea*, everywhere clothed with a glossy silky cobweb, in the young leaves partaking of a yellow tint. It flowers in April.—*Bot. Mag.*, 4384.

Angelonia angustifolia—*Narrow-leaved Angelonia.* Raised from seeds received from Mexico from Mr. Hartweg, in January, 1846. This is a half shrubby stove perennial, which grows freely in a mixture of loam, leaf-mould, and sandy peat in equal proportions, with plenty of moisture. It is easily increased by cuttings, and flowers from June to October, but afterwards should be kept rather dry, particularly during winter. It is a very handsome little plant, with deep violet flowers, and deserves a place in every stove or warm greenhouse.—*Jour. Hort. Soc.*, 3243.

Calceolaria cuneiformis—*Wedge-leaved Calceolaria.* Raised from seeds purchased from Mr. Thomas Bridges in 1846, and said to be from Bolivia. In its wild state, this plant is a stiff, short-branched bush, with small wedge-shaped leaves covered with white hairs on the under side. It bears two or three flowers at the end of each branch, which is closely covered with short rough hairs. In its cultivated state it has much larger and softer leaves, and weaker branches. The flowers are about as large as those of *Calceolaria integrifolia*, and of a pale lemon colour. It is a very pretty greenhouse shrub, with a better habit than the old shrubby Calceolarias.—*Bot. Mag.*, *Jour. Hort. Soc.*, v. iii., p. 242.

Cantua pyrifolia—*Pear-leaved Cantua.* Of all the Polemoniaceæ, and many of them, it must be acknowledged, are very handsome, some species of the present genus *Cantua*, are pre-eminently beautiful. We have now the pleasure of announcing a species reared in this country for the first time, by Messrs. Veitch and Sons, at their nursery, Exeter, from seeds sent by their collector, Mr. William Lobb, from Peru. This is, however, by no means the most showy of the *Cantuas,* and is likewise liable to vary. It flowered in March, 1848.

CITRUS JAPONICA. The Kum-quat. Received from China through Mr. Fortune. In the south of China great quantities of these plants are grown in pots, hence they are common in the well-known nursery gardens at Fa-tee. The plant, however, is evidently of a more northern origin, there being numerous groves of it on the island of Chusan and elsewhere in that part of China, where it grew in far greater perfection than it does about Canton. The Kum-quat groves of Chusan are formed on the sides of the lower hills, in those situations where the tea-shrub (*Thea viridis*) flourishes. The plants are arranged in rows, about four feet apart, and do not attain to a larger size than about six feet in height—from three to six feet is the size which they are usually met with. The fruit ripens late in the autumn, being then about the size of a large oval gooseberry, having a sweet rind and a sharp acid pulp. It is largely used by the Chinese as a preserve, and very frequently finds its way to England as presents to those who have friends in China. Preserved in sugar, according to the Chinese method, it is excellent. In China the Kum-quat is propagated by grafting on a prickly wild species of Citrus, which seems of a more hardy nature than the Kum-quat, although it will bear more cold than any other species of the Orange-tribe ; and if not quite hardy enough for the neighbourhood of London, would very likely prove so in such counties as Cornwall and Devonshire. It is well worth a trial in those districts, for if it would succeed as it does in the island of Chusan, it would be a striking and beautiful object.—*Jour. Hort. Soc.*, iii., 289.

LONICERA ANGUSTIFOLIA—*Narrow-leaved Lonicera.* Raised from seeds received from Capt. William Munro from the north of India. A slender deciduous shrub, with small pale-yellow flowers, growing four or five feet in height in any good garden soil, and is easily increased by cuttings. It flowers in April and May, and is not only a distinct, but rather neat-looking plant. Where a choice collection of hardy shrubs are grown, it deserves a place.—*Jour. Hort. Soc.*, iii., 238.

PÆONIA MOUTAN PARVIFLORA. Received in April 1845, as a variety from Shanghai. In flower this sort resembles the *P. moutan rosea,* but is much smaller, and of a very pale rose colour. The flowers are a good double, the centre being filled up with small narrow petals. In foliage it also resembles the *Moutan rosea,* but is a much hardier kind. It is very pretty when first expanded, but loses its distinctness as the flowers fade.

PÆONIA MOUTAN GLOBOSA. Two plants of this came from Shanghai in April 1845. It is a fine, large, round, white kind, with the base of the petals stained with large blotches of deep purple. The flowers are perfectly double, but are otherwise those of *P. Moutan papaveracea.* It is one of the finest of *Moutans,* both in size and form.

PÆONIA MOUTAN ATROPURPUREA. A very distinct and desirable variety, with deep lilac or purple flowers, nearly single, having only a few small petals in the centre. It appears to be quite new. The growth is vigorous. The foliage is deep green, with a little red. The petals are from six to eight, deep purple when full blown, but having a decided lilac tint when younger. It was introduced from China by Mr. Fortune.

PÆONIA MOUTAN SALMONEA. Received by the Horticultural Society from China, in April, 1846. It is a very dwarf kind, with flowers as dark as a Tuscany rose. This is a good, double, flesh-coloured variety, very much resembling the common *P. officinalis,* var. *carnescens,* in the flowers, and perhaps not very different from what has been called *P. Moutan carnea plena.* The outer petals, when fully blown, are a pale salmon colour ; the inner have a deep rich tint of the same. The leaves are pale green, with very little red about them. It is a good and distinct variety.

PÆONIA MOUTAN LILACINA. This much resembles the *P. Moutan Banksii* in the form of the flowers and in foliage, but the flowers are more double, and are shaded with a deeper lilac or purple. They are well filled up in the centre with small petals, which are deeper in colour than the outer ones. It is a nice variety, although not strikingly different from *P. Moutan Banksii.* The whole of the above *Pœonias,* with several others, were sent to the Horticultural Society by Mr. Fortune.—*Jour. Hort. Soc.,* 3, 236.

RHODODENDRON NILAGIRICUM—*Neelgherry Rhododendron.* This fine species of Rhododendron was introduced by Messrs. Lucombe, Pince, and Co., from Nepal. It is a lovely shrub, and, what adds to its value, perfectly hardy, having endured several winters in the open ground in Messrs.

Lucombe and Pince's Nursery. It flowered in April, 1848, and is perhaps the first of the species that has blossomed in this country. The flowers are a beautiful rose-colour.—*Bot. Mag.*, 4381.

Tetrazygia elæagnoides—*Elæagnus-like Tetrazygia.* A West Indian plant, as are all the species of the genus. It was raised at Sion House, from seeds collected in Jamaica, where it flowered in March, 1848. The flowers are white, and produced in terminal panicles.—*Bot. Mag.*, 4383.

Tropæolum Smithii—*Sir James Smith's Nasturtium.* A very distinct and elegant species of *Tropæolum*, for the introduction of which to our gardens we are indebted to Messrs. Veitch and Son, and to their indefatigable collector, William Lobb. It is a native of high mountains in Columbia, growing at an elevation of nine thousand feet above the level of the sea. Treated as the *Tropæolum majors* and *minors*, there is every reason to believe that it will prove as hardy. It flowers through the summer months.—*Bot. Mag.*, 4385.

Thyrsacanthus strictus—*Straight Thyrsacanthus.* This is a very pretty shrub, producing salmon-coloured flowers, arranged in short clusters in a naked, interrupted, slender, terminal, downy spike. It is a stove shrub, requiring the same treatment as *Justicias*, and easily increased by cuttings. It is a useful plant, as it remains long in bloom.—*Jour. Hort. Soc.*, 3, 237.

Vriesia speciosa—*Showy Vriesia.* A handsome species, better known in our collections by the name of *Tillandsia splendens*, under which appellation it has been received from Mr. Newman, of the "Jardin des Plantes" at Paris. The leaves are firm, dark-green, with black transverse bands. The scape grows from a foot to eighteen inches long, and is clothed from the centre upwards with closely-imbricated scarlet bracts and yellow flowers. It grows freely, fastened to a block of wood suspended in an Orchid-house.—*Bot. Mag.*, 4382.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Chirita Moonii. This fine species was exhibited by Mr. Smith, curator of the Royal Botanical Gardens, Kew. The plant is a native of Ceylon, and has fine bluish, lilac flowers, two or three inches long, and about the same in diameter. The foliage is of moderate size and pale green colour. The plant grows about eighteen inches high, and has an abundance of bloom.

Epacris, *seedling var.* Messrs. Low recently favoured us with five very distinct varieties of *Epacris*, the whole of them possessing the free and vigorous habit of *E. impressa.* No. 1. *E. campanulata*, is short in the tube, but spreads widely at the mouth, a very rich crimson, free bloomer, and very handsome. No. 2. *E. bicolor* is strongly allied to *E. grandiflora*, but considerably larger in flower and richer in colour. No. 3. *E. andromedæflora* is a very profuse bloomer, the individual flower in colour and appearance not unlike the Heath of the same name. No. 4. *E. densiflora* has a delicate rose-tinted flower, shading to white towards the mouth ; it is a most profuse bloomer. No. 5. *E. delicata*, is also very beautiful, large, and almost white, a slight blush tinting the flower ; we think this the finest flower in size we have yet seen : it is also a free-bloomer.

Hibiscus, *var.* A fine flower, pale sulphur colour, and dark chocolate centre, has copious and rich green foliage ; we noticed it flowering in the stove of Messrs. Rollissons, Tooting. We are unacquainted with its history, but suppose it is a seedling variety. The flower is about four inches in diameter.

Leptospermum bullatum. In the nursery of Messrs. Henderson, Pineapple-Place, we noticed some little shrubs having greatly the appearance of the common May, when in bloom, the individual flower being rather larger. It has the quality of being a profuse bloomer, pure white, and is highly attractive.

Periphragmus pyrifolia. Messrs. Veitch have flowered the above. It was found on the Andes in Peru, by their collector, Mr. Lobb ; grows from two to three feet high, and has rather handsome foliage. The stem is much branched, with the flowers terminal, in large trusses of whitish yellow-coloured blooms. We understand it is of very easy cultivation, requiring only a cool greenhouse for protection during the winter season.

Siphocampylus nitida. In the nursery of Messrs. Rollissons we noticed this little shrub in good flower: it grows only eight or ten inches high, has a very neat habit, small, deep-green foliage, from which is strongly contrasted the small, though bright scarlet and yellow blossoms, which are produced in great plenty over the plant.

VANDA BATEMANNI. A most noble-looking plant in growth, sending out an upright scape four feet high; the flowers are placed about an inch-and-a-half apart, and are about two inches in diameter, the external colour being bright crimson, while the inside is pure yellow very richly spotted with brown; the lip is small, but very bright crimson. The habit of the plant is very handsome, and is without doubt the noblest of the species. We noticed it in the collection of Mr. Mylam, gardener to S. Rucker, Esq.

Among the collections of plants exhibited at the July fêtes of the Horticultural and the Royal Botanical Societies, the following were perhaps the finest and choicest:—*Aerides odoratum*, an immense specimen completely laden with its delicate and deliciously fragrant blossoms, from Mr. Mylam, gardener to S. Rucker, Esq.; *Oncidium pulverulentum* well flowered, from Mr. Elliott, gardener to J. B. Boothby, Esq.; a nice specimen of *Cattleya citrina*, from Mr. Plant, gardener to J. E. Schroeder, Esq.; *Stanhopea Devoniana*, *Aerides affine*, very finely in flower for so small a plant, *Oncidium papilio major* and *O. Lanceanum*, with fourteen scapes of bloom, not all expanded, but exhibited merit in the cultivation, from Mr. Williams, gardener to C. B. Walner, Esq.; *Stanhopea tigrina*, from Mr. Ingram, gardener to Her Majesty, at Frogmore; *Stanhopea tigrina*, *Camarotis purpurea*, *Dendrobium chrysanthum*, and a fine *Miltonia spectabilis*, from Mr. Carson, gardener to — Farmer, Esq. The specimens of *Erica* were most numerous; we notice some of the best:—*E. infundibuliformis*, very fine, from Mr. Ayres; a handsome though small *E. Cavendishii*, from Mr. Gerrie, gardener to Sir G. Cathcart; *E. retorta*, an immense plant, from Messrs. Jackson, Kingston; *E. rubella*, *obbata*, *metulæflora*, and *metulæflora bicolor*, *gemmifera*, and others from Messrs. Veitch; *E. Savilleana*, *Massoni*, and others, from Mr. Cole, gardener to H. Colyer, Esq.; *E. Parmentieriana*, very handsome, from Mr. Bruce; *E. ampullacea* and *ampullacea rubra*, *Parmentieriana rosea*, *tricolor superba*, *jasminiflora alba*, from Mr. Epps, Nurseryman, Maidstone; *E. Irbyana*, *Julyana* and *depressa*, with others equally good from Mr. May. Messrs. Frazer exhibited some suberb specimens, consisting of *Sollya linearis*, *Allamanda cathartica*, *Crowea saligna*, *Kalosanthes miniata*, *Statice arborea* and *macrophylla*, *Ixora grandiflora*, *Stephanotis floribunda*, and *Schubertia graveolens*; *Æchmea fulgens*, with four stems, *Aphelexis humilis* and *grandiflora*, *Clerodendron paniculatum*, with two monstrous heads of bloom, in a collection from Mr. Cole; *Röella ciliata*, a beautiful specimen from Mr. May; *Curcuma Roscoeana*, from Mr. Iveson, gardener to the Duchess of Northumberland, Sion House; *Æschynanthus Lobbianus* and *pulcher*, two very handsome specimens remarkably well flowered, proving them plants deserving the best attention of cultivators; *Clerodendron affine*, a dwarf variety very well flowered, from Messrs. Rollissons, Tooting. Mr. Parker, gardener to J. H. Oughton, Esq., had a most beautiful collection of *Pelargoniums* for size of specimen and amount of bloom, consisting of the following varieties:—*Susanna*, *Rossetta*, *Duke of Cornwall*, *Matilda*, *Sir R. Peel*, and *Rosy Circle*. Mr. Glendinning, Chiswick Nursery, had a collection of *Statices*, consisting of the following species:—*S. arborea*, *fruticosa*, *pseudo-armeria*, *mucronata*, and *imbricata*. Mr. Storey exhibited a seedling Heath called *E. nobilis*, certainly not a very great acquisition as regards colour; the flowers, though large, are reddish at the base, shading to a dull yellow, differing very much in colour from any of the species.

OPERATIONS FOR AUGUST.

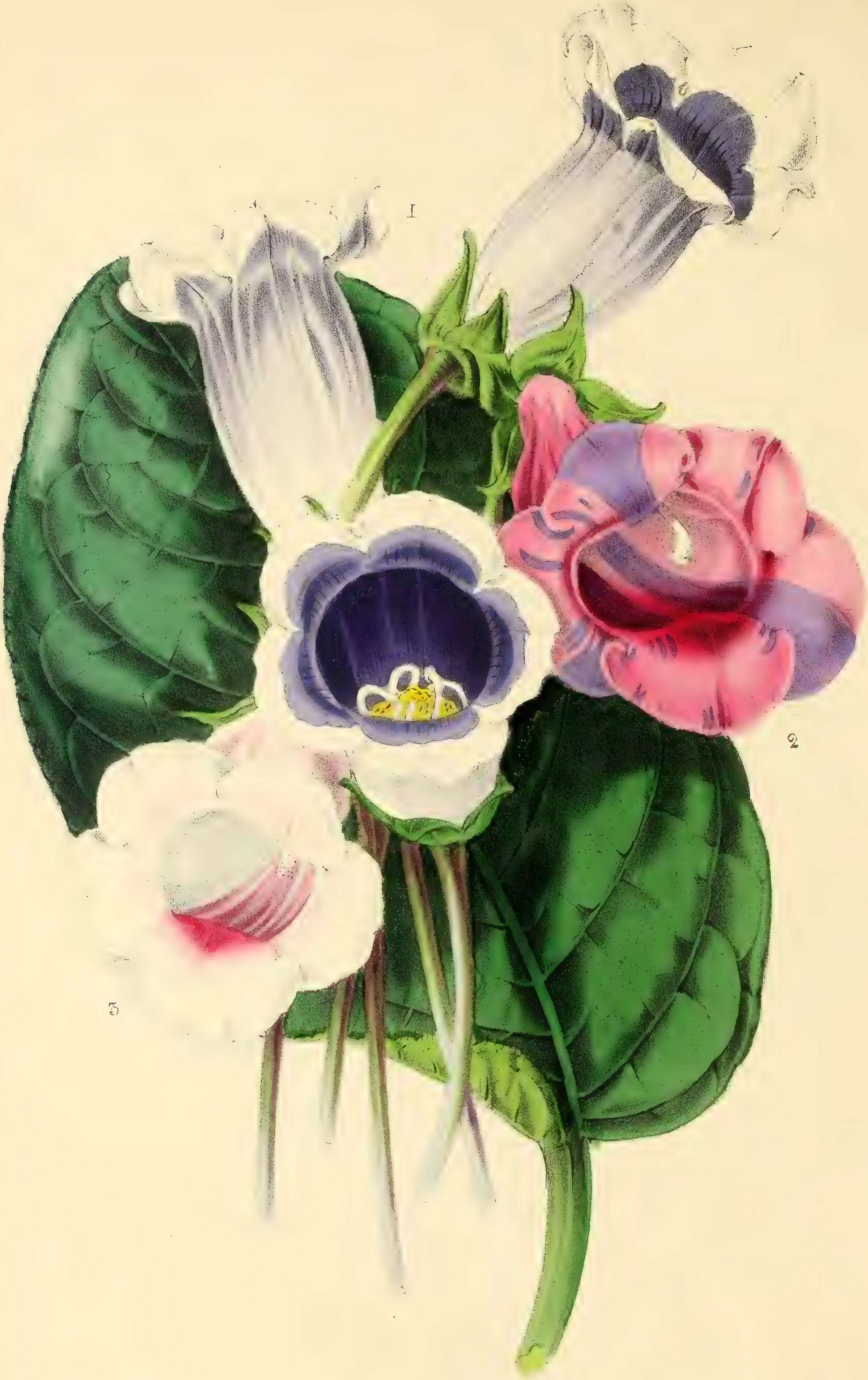
In the open flower-garden insects may perhaps become very prevalent; several species of saw-flies appear in their perfect state this month, and lay their eggs upon rose-trees; the larvæ do much damage to both leaves and wood. It is advisable to gather the cocoons and destroy them, but this must be done early in the month. The most destructive kinds are, *Hylotoma pilicornis* and *rosæ*, *Emphytus fasciatus*, and *Lyda hortulana.* Amongst moths also, several appear on the wing during this month, which in spring attack rose-buds and leaves; the caterpillars of *Lozotœnia rosana* may be collected now before they go into a pupæ state. Search for the cocoons of *Lozotœnia operana* and *lævigana*, *Argyrotoza Bergmanniana* and *Spilonota cynostabella*, before they become changed to perfect insects. Sow Stocks and Mignonette for winter flowering, not later than the middle of the month; the best soil for the purpose is composed of three parts light sandy loam, and one part very rotten dung. If a sufficient quantity of China rose-cuttings are not struck, put in as many as will be required, without delay, that they may have time to grow before winter. All blanks in flower-beds should be filled up without delay. If the days are bright and dry, watering will be necessary: attend to everything that will encourage growth as much as possible, as the season of vigour is fast passing away. Cut away dead flowers before they form their seed-pods, unless seed is an object; the flowering season is much prolonged by these means, and a splendid show may be reckoned upon throughout this month and September. Upright plants should be securely tied to stakes, as otherwise they are liable to have their heavy tops broken by winds. Mow, and keep everything as neat and clean as possible. If it is desirable to remove large evergreens to any particular position during the coming autumn, now is the best time to prepare for it, by digging a deep trench round the roots, at a sufficient distance from the stem to allow of a good ball. After this is dug out, and the straggling roots cut, the trench may be refilled until the time of planting; young rootlets will, by this means, be formed, which will greatly facilitate the plant's growth after its removal.

In frames and pits nothing is required but to keep the plants clean, and well supplied with water. Air in abundance will be very beneficial to all the young stock, and the more they are exposed to it, the better, when the weather is dry and fine.

In the Greenhouse and Conservatory carefully attend to watering, especially such plants as are in exposed places, and keep a healthy atmosphere; much of the show in autumn and following spring, depends upon the kind of management the plants receive now. Pelargoniums and Fuchsias which are intended to come into flower in September and October, should be well attended to now with every requisite of growth; the flowers of the former should be carefully picked off as soon as the buds appear, and the shoots of the latter should be frequently stopped to induce the growth of laterals and form the heads bushy; by these means the flowering season will be considerably delayed. If the weather should prove wet and unsettled any time this month, it would be advisable to take into the greenhouse again all the tender rooted kinds, otherwise they might become damaged, and all the previous good cultivation be lost. Trim off all flowers as soon as they fade; train, stop, and prune, so as to induce a low spreading growth. Give good ventilation, and keep every part of the houses free from dead leaves, and as clean as possible, and the healthy state of the plants will repay for all the trouble.

In the Orchid House less shade, generally speaking, will be required about the end of the month by the growing plants, unless the weather be very bright. Keep a very humid atmosphere, and air may be freely admitted. Those kinds which have finished their early growth, should have less moisture and more exposure to the light, that the shoots and bulbs may become mature for the season of rest.

In the common plant-stove ventilation, a moist atmosphere, watering, syringing occasionally, potting any that require it, and top-dressing, are the chief requirements to secure all that is desirable.



S. Holden, del & Lith

Gloxinias (hybrid var:) —

1 Fyfiana. 2 Teuchlerii. 3 albo sanguinea.

GLOXÍNIA.

HYBRID VARIETIES.

(1. Fyfiana. 2. Teuchlerii. 3. Albo-sanguinea.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.
(Gesner-worts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* superior, five-leaved. *Corolla* campanulate, limb oblique. *Filaments* with their rudiments inserted in the tube of the corolla. *Capsule* one-celled. *Receptacle* with two lobes.

GARDEN HYBRIDS.

1. FYFIANA.—A very delicate flowering kind. The bloom is sent up erect from the roots, and not drooping, like the parents. The *flowers* are somewhat campanulate, all the segments of the limb are equal, and this regularity in size and expansion renders the spreading lobes star-shaped. A rich purple stripe extends from the throat up the centre of each of the five divisions, leaving borders of the purest white. The habit of the plant does not differ from the general appearance of *Gloxinia speciosa.* Our drawing was made from a plant which flowered beautifully in the collection of Messrs. Veitch and Son, Nurserymen, of Exeter, in July, 1847.

2. TEUCHLERII.—In the nursery of Messrs. Rollisson, Nurserymen, of Tooting, we made our drawing of this singular hybrid *Gloxinia,* in April last. The flowers, as will be seen by the plate, are most curiously marked, the colours of the parent flowers, not being promiscuously blended together, but each in distinct alternate flakes of purple and pink, pure and bright; on the lower segment of the limb the pink becomes a deep rich crimson, extending to the throat of the tube. This very beautiful kind was raised betwixt *G. speciosa* and *G. rubra* by M. Joscht, gardener to Count De Thun, of Techen, in Bohemia. It was introduced to this country by Messrs. Rollisson last summer, under the name we have here adopted. It has also been called amongst nurserymen *Teichleri.* If the flower should continue true to its present character, it will prove one of the greatest favourites of this beautiful genus.

3. Albo-coccinea.—This fine hybrid is now in bloom at Chatsworth, but our drawing was made from a specimen which flowered in the nursery of Messrs. Backhouse, of York, in August, 1847. It fully sustains the high character given of it on its first appearance.

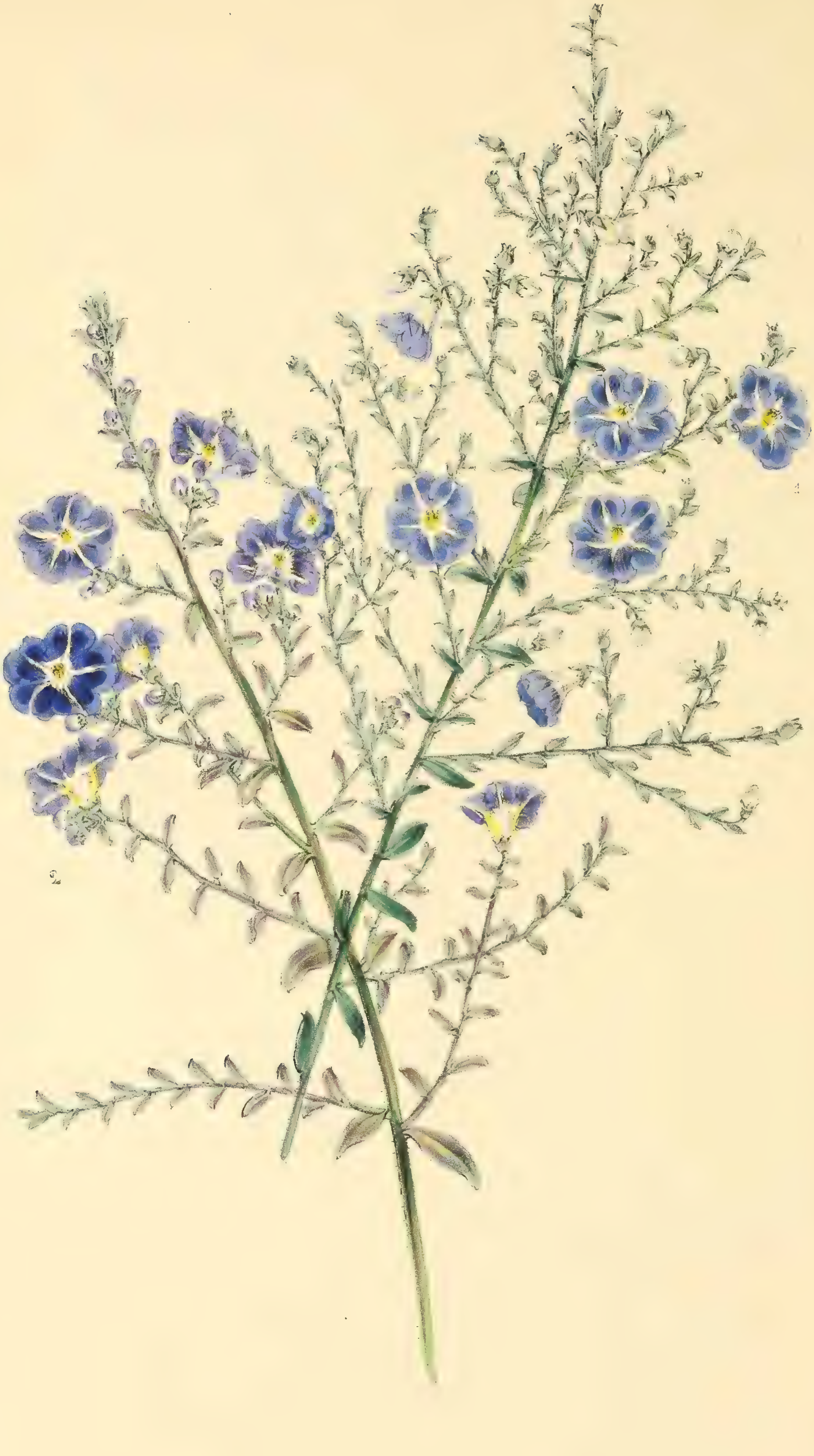
The flowers are of the most pure and delicate white, relieved with a broad dash of rich crimson extending through the lower segment of the limb quite down the tube, rendering the flowers quite unique. It appears to be a hybrid betwixt one of the white flowering species and *rubra*, and is certainly a very good kind.

All Gloxinias are easy of cultivation ; they thrive best in a soil composed of leaf mould well rotted, sandy peat, and a little sandy loam mixed and broken together.

A brisk heat and a good supply of water whilst in a state of growth, and to be kept quite dry and cool when in a state of torpidity, are almost the only requisites.

Increase is easily effected by either cuttings, leaves, or seeds, which latter are usually produced freely.

The genus is named in honour of a distinguished botanist named Gloxin, of Colmar.



S.Holden, del & Lith.

Evolvulus purpureo cæruleus.

1 light var. – 2 dark var.

EVÓLVULUS PURPÙREO-CÆRÙLEUS.

(Purple blue-flowered Evolvulus.)

1. Light variety. 2. Dark variety.

Class.
PENTANDRIA.

Order.
DIGYNIA.

Natural Order.
CONVOLVULÀCEÆ.
(Bind-weeds, *Veg. King.*)

Generic Character.—*Sepals* five. *Corolla* campanulate, or funnel-shaped. *Styles* two, bifid. *Ovary* two-celled, four-seeded. *Capsule* two-celled. — *De Candolle.*

Specific Character.—*Root* perennial, not very stout, throwing out branches and fibres. *Stem* a foot-and-a-half high, quite woody below, and often, for more than half way up, branched from the very base; main branches erect, stout below, gradually tapering upwards, and bearing several wiry, slender, patent, rigid, alternate branchlets, appresso-pubescent. *Leaves* hairy in the same way, small, especially the ultimate branches, all of them patent or reflexed, lanceolate, acute, entire, the smaller ones almost linear, the larger ones tapering below, but scarcely petiolate. *Flowers* terminal on the leafy branches, and pedicellate; or the pedicels are axillary, and generally bracteated at the base. *Calyx* with a short *tube*, tapering below, with fine, rather spreading, small, lanceolate segments, downy with appressed hairs. *Corolla* rotate, rich ultramarine blue, with the centre white, and a purple ray diverging from that up the centre of each lobe, the margin five-lobed, the lobes rounded, crenate; externally the corolla is silky. *Stamens* five; filaments and anthers white. *Ovary* ovate, two-celled, four-seeded. *Styles* white, each branched above the middle and club-shaped at the apex.—*Hooker*, in *Bot. Mag.*, v. 71, t. 4202.

The genus *Evolvulus*, as at present known, consists of about thirty species, all very pretty, and of the easiest culture. They are chiefly natives of tropical countries, where they grow in almost all exposed situations much in the same manner as our *Anagallis arvensis* does with us.

Eleven or twelve species are perennials, nine or ten are annuals, and six form small, and in most cases, procumbent semi-shrubs.

The prevailing colour of the flowers is blue, in various shades and degrees of intensity; but to this there are several exceptions, a few being white, and one or two yellow.

Ten of the species have found their way through various collectors to this country, of which our present little gem, in two brilliant varieties, is by no means an inconspicuous addition.

It is a native of Jamaica, where it was first discovered by Mr. Purdie, growing upon arid rocks in the neighbourhood of the sea, in the district of Manchester. The dark variety appears to be the natural one; and, according to Sir W. Hooker, Mr. Purdie's attention was first attracted to it, by the strikingly brilliant appearance of its blue flowers, which at first sight might almost be mistaken for those of the *Anagallis cœrulea.* "These flowers are borne upon erect, twiggy branches, with small patent, or reflexed leaves. Its nearest affinity, as to species, is *Evolvulus Arbuscula* of Poiret; but that species has still smaller, and erect leaves, not tapering at the base like those of *E. purpureo-cœruleus.*" *

It is a stove-plant, and was first raised from seeds in the Royal Botanic Garden, Kew, where also the pale variety first exhibited its pretty flowers. It has since bloomed in the collection at Sion House, and also in several other parts of the country.

Our drawing of the pale variety was made from a plant which flowered in the garden of Sir George Warrenden, during September, 1846; and the dark variety, from the pretty plant which Mr. Carton, gardener at Sion House, sent for inspection to the rooms of the Horticultural Society, Regent Street. Both the varieties are of easy culture, growing with great freedom in a light sandy soil, or a mixture of sand and peat.

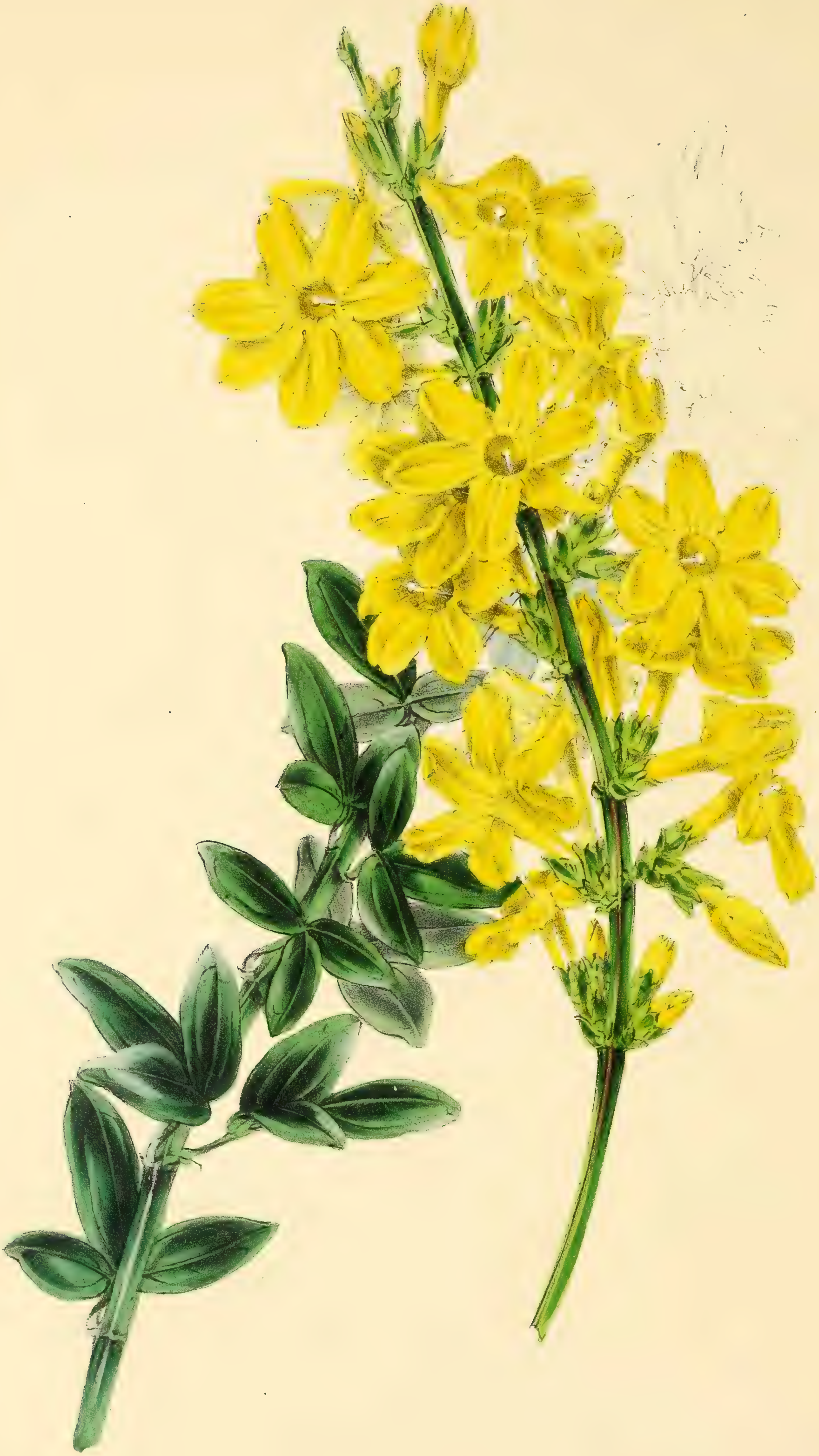
They require a brisk heat, and a light and airy situation; but enjoy a humid atmosphere, and a fair supply of water to the roots.

They increase freely by cuttings planted in sand, and placed in a gentle moist heat; and also by seeds, which they produce freely.

The generic name is derived from *evolvo* to turn, in the same sense as Convolvulus, to which they bear considerable resemblance.

---

* Bot. Mag., 4202.



S. Holden del. & Lith.

Jasminum nudiflorum.

JASMÌNUM NUDIFLÒRUM.

(Naked-flowered Jasmine.)

Class.
DIANDRIA.

Order.
MONOGYNIA.

Natural Order.
JASMINÀCEÆ.
Jasmin-worts (*Veg. King.*)

Generic Character.—*Calyx* five to eight-toothed, or five-cleft, tubular. *Corolla* five to eight-cleft. *Stigma* two-lobed or bifid. *Berry* didymous, having one of the lobes usually abortive. *Seeds* without albumen.

Specific Character.—*Plant* a shrub, with angular, deep-green, trailing *branches*, which have little disposition to branch in the first year of their growth. The *leaves* are shining, deep-green, and each consists of three sessile *leaflets*, of an ovate form. They fall off early in the autumn, soon after which they are succeeded by large yellow scentless *flowers*, which grow singly from the buds formed in the axils of the leaves that have previously dropped. The *limb* of their *corolla* is about an inch in diameter, and divided into six broad, oblong, blunt, flat segments.—*Dr. Lindley.* in *Journ. Hort. Soc.*, v. i., p. 153.

This new winter-flowering species of Jasmine is one of the introductions of Mr. Fortune, who sent it from Nankin, in China, to the Horticultural Society, in July, 1844.

It was at first treated as a greenhouse plant, but the specimen from which we made our drawing in January, 1848, flowered in the open air, in the garden of the Society at Chiswick; it was trained to a wall, slightly protected by a projecting straw roof. It is deciduous, a very free flowerer, and produces its blossoms, which appear quite destitute of fragrance, after the plant has lost its leaves. It grows freely in almost any kind of light soil; in the Horticultural Society's Garden it has been found to thrive vigorously in rough sandy peat.

If grown in a pot a good supply of water should be given to its roots during the summer season, and it should also be syringed freely over-head every day.

"In consequence of its slender habit it should be trained to a trellis, or to induce it to form an upright stem three or four feet high, so that the young twigs may hang down as they may be naturally inclined."*

It may be easily increased by cuttings of the half-ripened wood planted in sand, and placed under a glass in a little heat.

The generic name is derived from *Ysmin*, the Arabic appellation, although

---

* Journ. Hort. Soc., vol. i. p. 53.

Linnæus thought its derivation might be traced to *ion*, a violet, and *osme*, smell, from the delightful fragrance of many of the species.

All Jasminaceous plants are more or less ornamental, and deserve cultivation; some are handsome, but generally speaking their flowers are not showy; white is the prevailing colour, but there are a few yellow-flowering ones very good; their delicious fragrance, however, rather than their beauty, has rendered them universal favourites in almost all ages and countries. This property resides in an essential oil, which can be extracted from the flowers without losing the perfume. The oil of Jasmine, which is to be procured in our chemist's shops, is obtained from *Jasminum officinale*, *J. odoratissimum*, *J. grandiflorum*, and *J. Sambac*, which last is the *Ysmin* of the Arabs, and is the origin of our name Jasmine.

Jasminaceæ are chiefly natives of tropical India, although a few are to be found in South America, Africa, and its islands, and even in Europe. The greater number therefore would require the heat of the stove; a few grow in the greenhouse, and the others are hardy.

The greater part are twining shrubs, well suited for covering trellis or pillars, for which they are much employed.

The order as at present constituted consists of five genera—*Jasminum*, *Nyctanthes*, *Bolivaria*, *Menodora*, and *Balangue*.

Of the genus *Jasminum* upwards of eighty species have been discovered and described, but not more than one half have yet been introduced. The greater number bear *white* flowers, occasionally tinged with pink in various degrees, of which the following are peculiarly rich in fragrance:—

J. ARBORESCENS.—An upright-growing shrub, a native of the mountainous parts of Bengal; the flowers are large, and produced in corymbose panicles. It requires the heat of a moderate stove.

J. BRACTEATUM.—A native of Sumatra; its flowers are large, and produced in dense clusters. It is a climbing plant, suited for training to a pillar, and requires a warm part of the stove.

J. DISPERSUM or GOOJU-SOAH is a climbing greenhouse plant requiring a light airy situation. It is a native of Nepaul, bears large conspicuous flowers, and emits in the evening a very powerful fragrance.

J. ELONGATUM.—This is a native of the East Indies, where it grows in damp woods, and climbs to a considerable height amongst the trees, producing abundance of large, pure white, and remarkably fragrant flowers. It requires the temperature of a warm stove, and should be trained to a pillar.

J. GRACILE.—A greenhouse climber from the tropical parts of New South Wales. It should be grown in a warm part of the greenhouse, and be trained to a trellis or pillar.

J. GRANDIFLORUM OR CATALONIAN JASMINE is too well known to require description. It is a native of the East Indies, and a great favourite on account of the exquisite fragrance of its flowers.

J. LATIFOLIUM.—A twining species, native of various parts of the East Indies. It requires the heat of a moderate stove, and should be trained to a pillar.

J. LAURIFOLIUM.—A native of the mountains on the east of Bengal. It forms a slender climbing plant, requiring the heat of a stove.

J. OFFICINALE.—Well known as a hardy climber to almost every person.

J. PUBESCENS.—A fine greenhouse species, known in many collections by the name of *J. hirsutum*. It forms a loose, slender, straggling shrub, requiring support, and yet with but little disposition to climb. It was introduced here from the East Indies, but is supposed to have been originally a native of China.

J. SAMBAC OR ARABIAN JASMINE.—Several fine varieties of this beautiful kind are grown in our stoves; they all form evergreen climbing shrubs, and under liberal treatment will cover a considerable space, and produce a profusion of richly-fragrant flowers. The species is a native of the East Indies, extending over a very wide geographical range.

J. SCANDENS.—An evergreen twiner, suited for training to a pillar in the stove. It is a native of Bengal and other parts of the East Indies.

J. SIMPLICIFOLIUM.—A loose straggling shrub, a native of the Friendly Islands. It should be grown in the stove, and if tied to a stake so as to allow of the young branches hanging loosely around, it will produce its fragrant white flowers freely.

J. TRINERVE.—A native of the forests of Sylhet. It grows with us into a deciduous climbing shrub, requiring the heat of a moderate stove.

Amongst the species bearing *yellow* flowers may be noticed, as amongst the most fragrant—

J. HETEROPHYLLUM.—A hardy species of Jasmine, growing to a middling-sized straggling bush. It is a native of Nepaul; and, as a border shrub, the flowers are produced in abundance, and are very fragrant.

J. REVOLUTUM.—A very fine species, native of the mountainous countries north of Hindostan, and of Nepaul. The flowers are large, bright-yellow, and are produced in abundance, if the plants are grown in warm situations out of doors.

All the species enumerated above are of the easiest cultivation. The stove and greenhouse species grow with the greatest freedom in a mixture of light loam, peat, and very rotten manure; the hardy kinds will thrive in any common garden soil, if not heavy and wet.

Increase is effected by cuttings of the ripened wood planted under a hand-glass, and placed in a little heat.

SERICÓGRAPHIS GHIESBREGHTIÀNA.

(Ghiesbreght's Sericographis.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
ACANTHÀCEÆ.
(Acanthads, *Veg. King.*)

Generic Character.—*Calyx* five-parted, unequal. *Corolla* hypogynous, tubular, bilabiate; upper lip bidentate, lower lip three-toothed, lobes nearly equal. *Stamens* four, inserted in the tube of the corolla, included, didynamous. *Anthers* one-celled, awnless. *Ovary* two-celled. *Style* simple. *Stigma* two-cleft.

Specific Character.—*Plant* a dwarf half-herbaceous shrub. *Stems* smooth. *Leaves* opposite, oblong-lanceolate, glabrous, undulated, on short petioles. *Flowers* of a bright scarlet colour, sessile, produced in small loose, one-sided, downy panicles. *Calyx* hairy, parted into five narrow, unequal segments, divided to the base. *Corolla* tubular; tube an inch or more long; limb bilabiate; teeth of the lips blunt, equal.

Authorities and Synonymes.—Sericographis Ghiesbreghtiana *De Candolle, Prod.* xi., 730; *Journ. Hort. Soc.*, v. 3, 244; Aphelandra Ghiesbreghtiana of the Continental and English nurseries.

We are unacquainted with the native country of this fine species of a new genus, nearly related to *Justicia*. It was introduced a few years ago into Belgium by M. Galeotti of Brussels; and has since found its way into several of the continental nurseries: in 1846, Messrs. Rollisson, of Tooting, received a plant from M. Makoy of Liege, under the name of *Aphelandra Ghiesbreghtiana;* and from a splendid specimen which flowered in their nursery our drawing was made in March last.

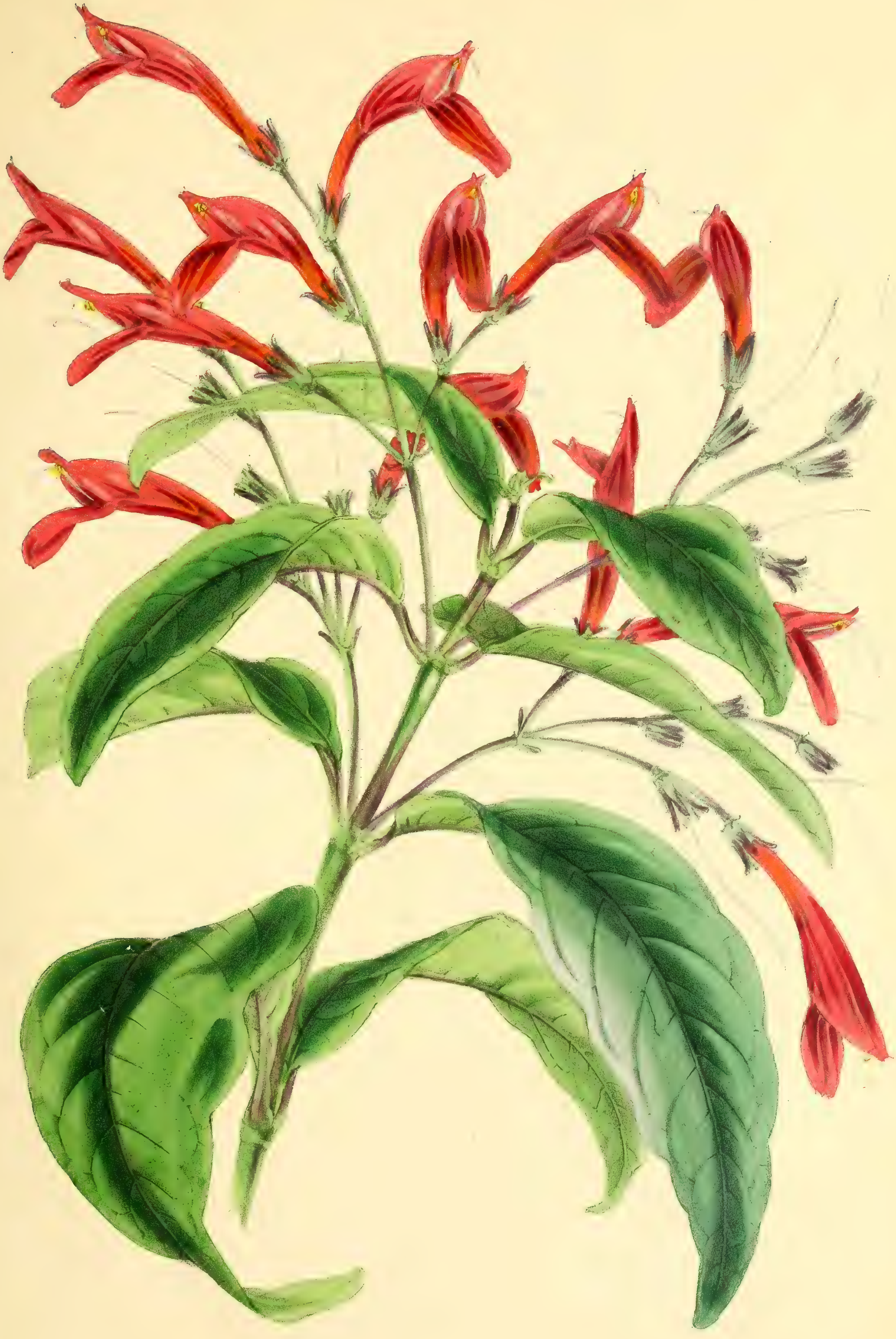
It is a shrubby species, requiring the temperature of the stove, and producing its fine scarlet flowers during the winter months; on this account it must be considered as an acquisition. It requires similar treatment to that given to *Justicias*, and, being a plant of vigorous growth, a good share of pot-room is important.

The soil may be composed of good light turfy loam, heath-mould, and sand, with a little leaf-mould or very rotten dung added; and, always insure a good drainage.

When in a vigorous growing state, give a liberal supply of water, both at the roots, and also by syringing; by this means the plant will be kept free from insects, to which all these soft-wooded kinds are very liable, and its development will not be interrupted.

A brisk moist heat is necessary to grow it well; but during the season of its torpidity a limited supply both of heat and moisture are advantageous.

Increase is effected by cuttings planted in sand, and placed in heat under a glass.



S. Holden del. & Lith.

Sericographis Ghiesbregtiana

EXPOSURE OF PLANTS.

Before the general practice of bedding out and grouping in masses was adopted in the best gardens, it was usual to empty the greenhouse, which generally contained a miscellaneous, ill-assorted collection; and about midsummer to expose nearly all its tenants to the influence of the air, sunshine, and rain, without hesitation or reflection. At the commencement of the present century, the science of gardening was little thought of; persons acted by rule and routine; hence, in less time than one fortnight after the turn of days, unless the season happened to be showery, and the temperature below its usual average, an entire collection lost all its pretensions to beauty; the verdure of its foliage was exchanged for a sickly brown, and the gaiety of its bloom had utterly passed away.

As philosophy and science advanced, some observant writers took up the subject of summer exposure. Among these we may cite the authority of Mr. Marnock, now curator of the Royal Botanic Garden in the Regent's Park. The following items will explain the writer's opinion of "The practice of turning greenhouse plants out of doors in summer—particularly when adopted early in the season:"—

"From the changeableness of our climate, and the too frequent, because often un-needed, use of fire-heat to guard against sudden attacks of frost, a degree of excitement is induced, and before the season has arrived at which they can be safely exposed to the open air, the plants are nearly all in a state of vigorous growth. In this state they are at once removed to summer quarters, when, although the frosty nights may have gone by, the temperature is often so low that a complete check is given, from which they seldom recover till toward the approach of autumn; when, after having regained their energy and become inured to their new climate, they make a new effort to grow."

Mr. Marnock is right; but he has not taken into account the peculiar agency of full solar light, undiluted (if the expression be permitted) by the agency of refraction, which had operated so decidedly through the interposed medium of a crown-glass roof. A Fig Tree in the highest state of verdure was once removed to the open air from a temperate stove. In a few hours every leaf was paralysed, and the entire foliage fell off. This afforded one ocular proof, among many others, of the injury which plants sustain from a sudden and direct exposure to the sunbeams, and also to the violence of unintercepted currents of wind.

"Orange Trees, Camellias, and, indeed, all plants with coriaceous, or thick, fleshy leaves, are, from a variety of causes, liable to be injured by the sun; but this injury would seldom occur were they retained in the house both summer and winter, and kept as cool as possible during the latter season. Consistently with the above considerations fire-heat need never be applied till the thermometer in the house has indicated three or four degrees of frost."

The untempered solar heat, it may be added, arrests transpiration, and injures the oscular pores; the juices are scalded, hence the tissues of thick-leaved plants are paralysed, and cease to perform their healthy functions. A northern aspected greenhouse is the preventive; it constitutes the only safe habitat for such plants during summer, and without it a gentleman's establishment cannot be complete. Heaths, Epacrides, and the hair-rooted tribes, demand the same protective treatment as to aspect, but for these, dry, airy pits will be unobjectionable. Mr. Marnock meets another dilemma, and suggests its removal by a method which we have seen adopted, particularly in a fine conservatory belonging to the late Marquis Thomond.

"The chief objection to plants being kept in the house during summer is that, exposed to the sun, the earth in the pots becomes dry, and the extremes to which the roots are subjected, cause the plants to assume a brown, unhealthy aspect, and some of the lower leaves to fall off. As a remedy nothing more is necessary than that an empty pot, which is intended to receive, and form a screen, for the pot that contains the plant, be sufficiently large to receive the latter within it, so that the tops of both be nearly level. I have," adds Mr. Marnock, "practised this for the last three years, both with stove and greenhouse plants, and during the dry weather of 1832, at least one hundred of the latter had their pots protected in this way. Those who cultivate tropical ferns will also find it of service in preserving the delicate roots of those plants from the effects of dry heat."

We find these remarks in the "Gardener's Magazine" of 1834. It is refreshing thus to refer to the labours of the late Mr. Loudon, its assiduous editor. Thus, the article which immediately follows the one written by Mr. Marnock, contains matter that has been, and can again be, converted to great profit, and is equally relevant to the subject now under consideration.

In the year 1833, the writer, who appears to have been a gentleman's gardener, tells us that he found, in 1827, a stock of seedling *Rhodendron ponticum*, left by his predecessor, amounting to several thousands. The plants were then in a 3-light frame, and in order to turn them to account three thousand of the largest were selected on the 28th of July following, and carefully lifted from the seed-bed with a little ball of earth attached to each. It is not so stated, but there can exist little doubt that this earth was the sandy heath-mould erroneously called "peat." As a preparatory step, a north border behind the forcing-houses had the original soil removed to the depth of fourteen inches, and the place filled with "peat earth." In this, the plants were set in nurse beds, the rows one foot asunder, the plants nine inches apart in the rows; they were then plentifully watered with a pot and rose. The expense of preparing such a bed with "peat" being considerable, the gardener resolved to give the remaining stock (above 1500) a trial in the common light sandy soil of the garden. Part of a north border within the kitchen-garden was well dug, and the surface smoothly raked; the best plants were then selected, and planted in rows across the border in distances as before; a good supply of water was then given. Seven hundred of the worst plants still remaining, were placed among a young plantation of Filbert Trees, where the earth was similar, but the situation much exposed. As to the results, the first set of plants flourished most for a time, having the double advantage of greater strength, and a natural soil peculiarly suitable to their then condition, insomuch that "three-fourths of them were planted out in groups in various parts of the pleasure-grounds and woods, during the winter of 1830 and 1831, without any other preparation than the ground being well trenched two feet deep, and the surface of the bottom well broken." The second set in the border of sandy loam, grew less strongly during the first year, but they soon after became as well rooted as those in the heath border, and were equally capable of being moved with good balls attached—"a circumstance which very few would credit did they not see it, but one which has been witnessed by many perfectly well qualified to judge, and among others, by Mr. W. M'Nab, of the Royal Botanic Gardens, Edinburgh."

They who are acquainted with the earth of Mitcham Common, and have visited the fine American grounds of Messrs. Rollisson on its southern boundary, barely two miles from Croydon, Surrey,* will not be surprised at the successful treatment of the Rhododendron in a pure sandy loam. In those grounds all the new hybrids of that beautiful plant, the choicest Azaleas of America and Europe, the several species and varieties of Kalmia, &c., &c., not only grow, but flourish with a luxuriance and beauty of foliage and bloom which cannot be surpassed. Most of the nurseries around Croydon, Mitcham, and the neighbouring towns, supply themselves with this loam, and hence it is that plants of the above families are seen everywhere. The earth of Mitcham Common is not a black, sandy, heath mould, but an unadhesive compound of hazel loam, abounding with a peculiar sand of fine quality, which renders it open and friable; it is also replete with the fibres of those short grasses which form the turf of a sheep common.

Wherever earth of a similar character exists, Rhododendrons will flourish, and, with the addition of some sandy heath soil, nearly all the hair-rooted evergreens and "bog" plants will do so also. As respects Rhododendrons, the article under consideration further stated that, if ground has been prepared "by trenching, and breaking the surface so that all the grass and vegetable matter be properly mixed, no 'peat' (heath-mould) whatever will be required: even in banks of very strong clay the Rhododendron grew luxuriantly." In that case, however, "the ground had been well trenched, and pits or holes were made according to the size of the plants, a portion of peat-earth being placed around and under each plant."

Some years since, a large bank for the aforenamed evergreens and Ghent Azaleas was prepared in a nobleman's pleasure grounds near Taplow, in Buckinghamshire. The soil was naturally a heavy binding loam; it was thoroughly dug and laid out; holes were made, and into each a suitable quantity of "Bagshot" heath-soil was given to every plant, according to the capacity and bulk required. Uniformity of appearance was preserved by raking the loamy earth to a little depth over the black soil. Every other operation being attended to according to time and season, the plants flourished, grew, blossomed, and produced a charming effect for years.

---

* The writer was sorry to observe in this nursery, and also in one near Croydon, many Rhododendrons and Kalmias with leaves half-way dead and brown, as if affected by an atmospheric epidemic (early in August instant).

Between Hampstead and London, about Haverstock-hill, numbers of Rhododendrons were seen a few years since growing in the nursery grounds and little gardens in front of the villas. They appeared in good health, although the soil was a strong and clodding loam, resembling brick earth. The observation was casually made at the time, but it accords with remarks which have been frequently made. Mr. Gow, from whose paper so much has been extracted, distinctly stated it to be his opinion that American plants, usually grown in peat, "will grow and thrive even in clay, and perfectly well in loam if it be well trenched, and a portion of leaf-mould and of the scrapings off roads be mixed with it, the shrubs being planted from the second week of August to the beginning of December, in the neighbourhood of large trees, so as to be benefited by their shade." He includes Kalmias, Azaleas, Andromedas, Vacciniums, and Cistuses. We can attest that in the high woody lands and banks of Cleifden domain, Bucks, hundreds of self-sown seedling Rhododendrons flourished equally as the laurel.

It is urgently recommended to all persons who desire to cultivate Rhododendrons extensively, to raise the stock from seeds. The mode is a cheap one, and the variety obtained is almost endless as to shape, size, and colour, both of the leaves and flowers, particularly the latter. The seeds are sown in February, upon a gentle hotbed.

We make no apology for thus trespassing upon the communication of an able and practical man. Fifteen years have elapsed since publicity was given to his article, and though many professional gardeners may have been and are equally skilful and fortunate, there have arisen thousands of amateurs who could not have met with the article, and to whom the information thus extracted from it may prove extremely valuable. We unfortunately know but little of causes, and are still in great doubt concerning the agency of earths, and of the decomposable substances with which they are and can be combined. Hence the necessity of enlarged experiments, and the careful observation and registry of results. As organic chemistry extends its analytic inquiries, we may perhaps arrive at some discoveries which will lead to general principles and the adoption of precise modes of practice.

ON THE CULTURE OF VARIOUS SPECIES OF STAR-APPLE.

THE Cainito or Common Star-Apple, is the *Chrysophyllum Cainito* of Linnæus, and the *Sideroxylon Pacurero* of Lœfling. It is a native of the West Indian Islands, and various parts of the continent of America within the Tropics, and belongs to the natural order *Sapotaceæ*, or Sapotads of Lindley's Vegetable Kingdom.

In its native country it grows to a *tree* fifty or sixty feet high, forming a large wide-spreading head. *Bark* reddish-brown. *Branches* spreading, covered with a rusty tomentum whilst young, but which passes away as they advance in age. *Leaves* alternate, entire, elliptical, betwixt four and five inches long, acuminated, dark green, and smooth above, but thickly clothed beneath, with short, soft, silky hairs. *Nerves* parallel and transverse. *Petioles* short, clothed with silky hairs like the leaves. *Flowers* small, produced in umbellate fascicles, arising from the axils of the leaves, and from the extremities of the young branches. *Calyx* five-parted, rust-coloured, silky. *Corolla* campanulately-rotate, with a five-parted spreading limb, yellowish-white. *Stamens* five, inserted in the tube of the corolla and opposite its segments, small. *Filaments* short. *Ovary* ovate, hairy, ten-celled; cells one-seeded. *Style* short. *Stigma* obtuse. *Fruit* a large, almost globose, ten-celled berry; the skin rose-coloured, smooth and shining; the *pulp* soft, sweet, and possessing a pleasant flavour, but rather clammy, and when over-ripe, becoming quite insipid. It is, however, much eaten by the natives, and forms one of their esteemed fruits.

Three other varieties besides the rose-coloured are cultivated, which by Europeans are considered superior to the species, viz.:—

The Purple Cainito (*C. Cainito Jamaicense*).—The *fruit* of this kind is purple, with a *pulp* of the same colour, and is more juicy and of a better flavour than the species.

The Blue Cainito (*C. Cainito cæruleum*).—The *fruit* is blue, as is also the *pulp*; and the flavour is fully equal to the last.

The Cuba Cainito (*C. Cainito microphyllum*).—This forms only a small bush, scarcely exceeding ten feet in height, and often not more than six. The *leaves* are smaller than the species, as is also the *fruit;* the flavour, however, is fully equal to that of the common kind.

These four varieties of Cainito, or Common Star-Apple, were introduced in 1737 by Philip Miller; but, until the last few years, they were nearly lost from our Collections, and those which remained in this country, were retained in our stoves chiefly on account of the beauty of their bright and silky foliage, as the flowers are very inconspicuous, and but seldom produced; and the fruit has not been ripened, that we are aware of, in any part of Europe. The season for flowering is mid-winter.

Besides the Common Star-Apple, several other species of *Chrysophyllum* produce fruit, which, by judicious cultivation, might become superior even to the *Cainito*. These are—

The Small-fruited Star-Apple (*Chrysophyllum microcarpum*).—A native of Hispaniola, where it grows on the banks of rivers, and forms a tree-like *shrub* twenty or more feet high. The *leaves* are ovate, acute, smooth and shining above, but covered beneath with pale silvery down. *Corolla* white, covered thickly outside with whitish silky hairs; the segments are concave and obtuse. *Fruit* the size of a damson plum, and not much unlike that fruit in form; *pulp* very sweet, with a delicious flavour. *Pedicel* fixed obliquely.

THE MICHINO STAR-APPLE (*Chrysophyllum Michino*).—This species is stated by Don to be a native of Bracamoras, near Cavico and Matam. It there forms a *tree* forty or fifty feet high, with tapering, smooth, rusty-looking *branches*. The *leaves* are about three inches long, thickly set upon the branches, smooth and of the same colour on both surfaces, obovate, and somewhat blunt. *Flowers* small, white, and produced both from the axils of the leaves, and also at the termination of the young branchlets. *Fruit* when ripe, of a bright yellow outside, whitish and clammy inside; *pulp* full of juice, sweet, and with a grateful flavour.

THE DAMSON STAR-APPLE (*Chrysophyllum monopyrenum*).—This is the *Chrysophyllum oliviforme* of "Lam., Encyclop.," v. i., p. 552; *C. Cainito* of "Miller's Dictionary;" and *C. Cainito*, variety β of Willd., Spec. 1, p. 1083. It is a native of Jamaica, St. Domingo, Martinico, and many other parts of the tropics, growing in thickets, and forming a *tree* about thirty feet high, "with a *trunk* not exceeding a foot in diameter, covered with a cracked, and roughish, but otherwise pretty even or equal ash-coloured bark. The *head* is thick, close, and bushy in the middle, but not of a regular-formed shape; and the outer *branches*, projecting into the air with a certain fan-shaped regularity, have a very light and elegant appearance when seen from beneath, in relief against the sky. The general aspect and shape of the whole somewhat resembles a fine young vigorous Hawthorn tree. Terminal or young leaf-bearing *branchlets* growing out in a regular, flattened, horizontal, fan-like form, as if they had been regularly trained against a wall, densely clothed with a coat of ferruginous adpressed hairs, which easily rub off, and ultimately disappear. Young *leaves* clothed on both sides with similar hairs, which disappear from the upper surface in a short time. *Petioles* short, about an inch long, densely ferrugineo-pubescent. All parts of the tree, while young, are milky when cut or broken. *Leaves* alternate, oval, approaching to oblong, four or five inches long, and two broad; shortly acuminate, sometimes retuse, entire, with simple, parallel, equidistant, inconspicuous nerves above, when adult, smooth and shining; beneath, beautifully satiny, with pale, ferruginous, close-pressed, silky hairs; the midrib and nerves deeper ferruginous than the rest. Before they fall, the leaves turn to a beautiful deep rich red, variously marbled and mottled with yellow or white. *Pedicels* axillary all along, and at the ends of the branchlets, and even coming out here and there on the older, thicker branches; aggregated, very irregular in number, shorter than the petioles, round, densely ferrugineo-pubescent. *Flowers* very small, scentless. *Buds* globose, ferrugineo-pubescent. *Calyx* of five, or often six, rarely four, rounded, imbricated sepals; the two or three outer ones densely ferrugineo-pubescent. *Corolla* sub-campanulate, pale greenish or yellowish-white, clothed outside with shining close-pressed hairs of the same colour; *tube* longer than the calyx; *limb* in five or often six, rarely four, shallow, ovate-obtuse, patent, sub-revolute lobes. *Fruit* a shining, purplish-black, ovate-oblong *drupe*, about an inch long, and half-an-inch broad, narrowed, and almost pointed at the top, but otherwise much resembling a Date in figure, tipped with the dry remains of the short style, and cupped at the base by the persistent calyx. It abounds in a viscid milk; and the flesh is tolerably juicy and sweet, with something of an astringent, fig-like flavour.*

The Silvery-leaved Star-Apple (*Chrysophyllum argenteum*).—This kind is a native of Martinico, whence it was introduced in 1758. It forms a tree-like *shrub* fifteen or twenty feet high, with wide-spreading, slender *branches*. The *leaves* are ovate-oblong, falcately acuminated, smooth and shining on the upper surface, and clothed with a silvery tomentum beneath. *Fruit* round, of a dirty-purplish blue colour, about the size of an Orleans plum. *Pulp* blue, soft, juicy, and with a pleasant flavour.

The Glabrous Star-Apple (*Chrysophyllum glabrum*)—is also a native of Martinico, whence it was introduced in 1823. It grows to a spreading *shrub*, twelve or fifteen feet high; the *leaves* are about two inches long, ovate-oblong, and smooth on both surfaces. The *flowers* are white. *Fruit* elliptical, about the size of an olive, smooth, of a purplish-blue. *Pulp* sweet and clammy.

The Pitakara, or Roxburgh's Star-Apple (*Chrysophyllum Roxburghii*). A native of Silhet, where it grows to a middle-sized tree. The *leaves* are lanceolate-acuminated, smooth on both sides, with parallel veins, and three or four inches long. The *fruit* is globose, five-seeded, the size of an Orleans plum, smooth, and when ripe of a bright yellow colour. The *pulp* is firm, sweet and very clammy, but when fully ripe is rather insipid; the natives, however, eat it greedily.

The Narrow-leaved Star-Apple (*Chrysophyllum angustifolium*).—A native of St. Domingo, where it attains the height of twenty feet. The *leaves* are about the size and shape of those of the privet; the upper surface dark green, and shining, with parallel veins, and the under surface clothed with ferruginous tomentum. The *fruit* is olive-shaped, two-seeded, and irregular at the base.

The Long-leaved Star-Apple (*Chrysophyllum macrophyllum*).—A native of Sierra Leone, whence it was introduced in 1824. It forms a lofty *tree* from sixty to one hundred feet high. The *leaves* are long and large, oblong-lanceolate, thickly clothed beneath with ferrugineous tomentum. *Fruit* large. *Pulp* sweet, clammy, and with a rather pleasant flavour.

Although many of the above kinds, in addition to their value as fruit-bearers, become timber trees, yet their wood is generally porous, and soon perishes if exposed to the weather; the natives, therefore, use it only for in-door work, for which it answers well.

All the species and varieties are of the easiest culture.

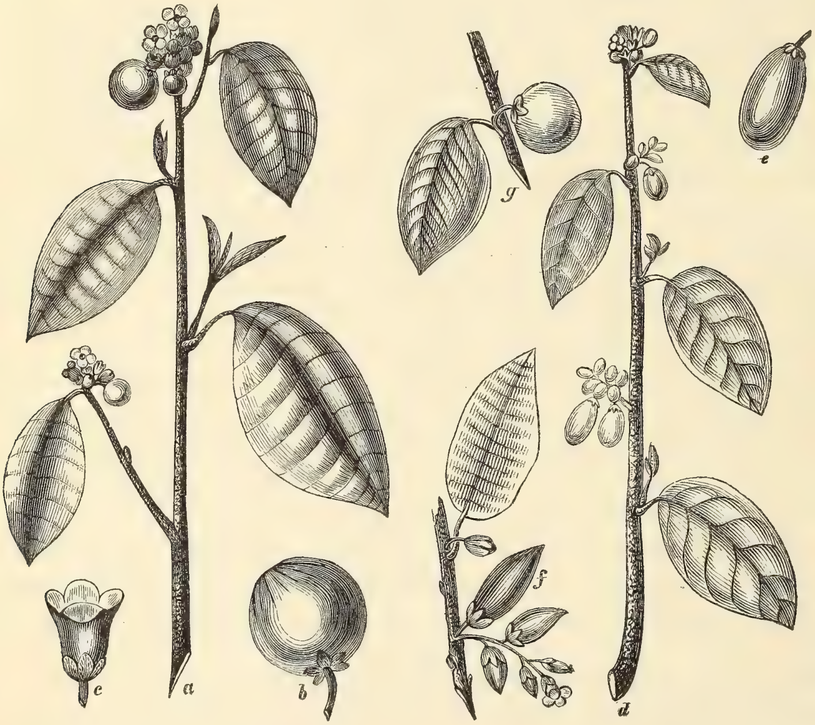
The temperature requisite is that of a moderate stove, where they can receive a good supply of air and moisture at one season of the year, and partial drought with a little bottom-heat at the other. One of our plants of the *C. Cainito*, at Chatsworth, is planted out in the east border of the large conservatory, contiguous to the flue, where its roots can receive a considerable portion of heat, and in this situation it appears to flourish well, although at present it has not shown a disposition to flower. Our observations on the treatment of this and other species at Chatsworth would warrant us in drawing the following conclusions as to their cultivation as fruit trees:—

---

* Hooker, in "Bot. Mag.," 3303.

If the plants are to be grown in pots or tubs, a mixture of two parts turfy loam, one part sandy peat, and one part very rotten manure, roughly broken and well mixed, is the best soil; but if it is desirable to grow them in the border of a stove, any rich turfy loam, without admixture, will answer the purpose.

Good drainage, if in tubs, and a well-drained place in the prepared border, for such as are turned out, is of importance; for although some of the species naturally grow on the borders of rivers, and in other situations where their roots have free access to moisture, yet they soon become stunted in their growth and diseased if subjected to stagnant water.



DESCRIPTION OF THE WOOD-CUT.

a Branch of the Common Star-Apple (*Chrysophyllum Cainito*), showing the inflorescence.
b A detached fruit of *C. Cainito*.
c A detached flower of ditto.
d Branch of the Small-fruited Star-Apple (*Chrysophyllum microcarpum*).
e A detached fruit of ditto.
f Branch of One-seeded Star-Apple (*Chrysophyllum monopyrenum*).
g Branch of Michino (*Chrysophyllum Michino*).

Moderate bottom-heat is an important requisite, but care must be taken that this is not very strong, either over moist or over dry; as an average, about 70° is sufficient, with moisture to prevent the roots becoming parched.

During the spring season, give plenty of air, and only a moderate degree of heat. The chief growth takes place during July, August, and September. The flowering season of most of the species takes place betwixt November and April. In winter the plants require more heat, especially at the roots, than is generally given to the stove; by this means the wood becomes hardened and the plants are able to perfect their flowering buds, and thus success may be safely anticipated.

Syringe and water freely during the time of vigorous growth; give a liberal supply at the roots during the season of flowering, and occasionally supply with thin liquid manure; whilst the plants are in torpidity keep them rather dry than otherwise, especially over their tops; when the fruit swell, also treat liberally with water and liquid manure; but curtail the quantity on the fruit approaching ripeness; this will insure a good flavour.

THE MUSTARD TREE.

How various have been the conjectures respecting the Mustard tree of the ancients, and, until a few years ago, how little was with certainty known. The greater portion of readers believed it to be either the same plant grown by us under the name of Mustard, or some other species of the genus, a native of Eastern countries, assuming a tree-like size on account of the fineness of the climate, and the peculiar richness of the soil. The species which have been selected by different persons as the probable ones are as follows:—

THE PERSIAN MUSTARD (*Sinapis Kaber*).—A yellow flowering annual, common throughout Persia and Syria, growing about eighteen inches or two feet high, and flowering in June and July. Introduced to this country about thirty years ago.

THE ORIENTAL MUSTARD (*Sinapis orientalis*).—This is also an annual, growing abundantly in most Eastern countries, after the manner of our Charlock or Kedlock (*Sinapis arvensis*). It produces its yellow flowers in June, will attain the height of two feet or more, and was introduced in 1778.

THE EGYPTIAN MUSTARD (*Sinapis turgida*).—This species is distributed throughout Egypt and all the neighbouring countries, and has been thought to be the kind mentioned by the writers of the Talmud as becoming sufficiently lofty and spreading to cover a tent, and also growing into a large branching herb sufficiently strong to bear the weight of a man. It is only an annual, however, bearing yellow flowers, and usually growing about three feet in height, although under peculiar circumstances it will grow much higher. It was introduced to this country in 1819.

THE TREE MUSTARD (*Sinapis fruticosa*).—A small semi-shrubby species, usually growing from eighteen inches to two feet high, and under favourable circumstances to three feet. It is a native of Madeira, and is not, that we are aware of, found either in a wild or cultivated form in Syria or any of the neighbouring countries. It produces yellow flowers, and was introduced in 1777.

Of these four species of Sinapis, the three first are annuals, and with the exception of the Egyptian kind (*S. turgida*) are of low growth, and spread very little; and although the latter under peculiarly favourable circumstances may attain a considerable size, yet its ordinary height being only about three feet, it would scarcely appear a suitable plant to select as an illustration of the subject, into which the Mustard tree is introduced in the sacred writings.

The fourth species (*S. fruticosa*) possesses more of the characters of the Eastern Mustard tree than any of the others, but not being a native of Syria, or any of the surrounding countries, and our ignorance as to whether it was ever known to the ancients, probabilities are against its being the plant intended, and also from its low growth it could scarcely be viewed in the light of a tree, but rather as a garden herb.

In the sacred writings the Mustard tree is several times mentioned. In Matthew xiii., v. 31, 32, the seeds are described as very small (" the least of all seeds "), and the plant, when matured, to be the greatest among herbs, and becoming a tree, so that the fowls of the air may come and lodge in the branches; in Mark iv., v. 32, it is said to become the largest of all garden herbs, and to form great branches; and in Luke xiii., v. 19, it is said to increase and grow up to a tree. From these several descriptions, it will be apparent that none of the foregoing species of *Sinapis* can be the true Mustard of the ancients.

The great Linnæus believed that it was a species of *Phytolacca*, which he named *asiatica;* little, however, is known of this species; it may possibly be identical with either *Phytolacca abyssinica* or *Phytolacca dodecandra.* The first of these forms an evergreen shrub, from six to eight feet high, and spreading in proportion. The *leaves* are oblong-lanceolate, and the *flowers* are produced in semipendent racemes, from the axils of the leaves. The *sepals* are five, and the *fruit* is a ten-seeded berry. It was introduced in 1775.

THE PHYTOLACCA DODECANDRA is an herbaceous species, which grows to six or eight feet high. The *leaves* are ovate-oblong, with a recurved point, and the *flowers* are red and produced in axillary racemes. A gentleman of the name of Frost has considered this species to be the true Mustard tree.

Phytolaccads are nearly related to, and were formerly associated with Chenopods (*Chenopodiaceæ*), but at present they are separated into nine genera, and constitute a natural order called *Phytolaccaceæ.* They are all more or less acrid, but in some this property is considerable; heat, however, will dissipate the greater part of it, and hence the young shoots and leaves of *P. decandra* are boiled and eaten, the former like asparagus, the latter like spinach. A rich scarlet colouring matter is also obtained from the berries.

During the travels of Captains Irby and Mangles, and also of Mr. Banks, in Egypt and Syria, they observed a tree, which, from its Arab name, and the uses made of its berries, they believed to be the true Mustard tree. On Mr. David Don examining the specimens furnished by these gentlemen, he found them to be taken from a very different plant to any species of Sinapis or Phytolacca, and to belong to an entirely new genus, which has been named *Salvadora*, and the species *persica*. The peculiarity of its structure does not allow of its being associated with any previously-known order of plants; it therefore stands as the type of a new Order, named *Salvadoraceæ*.

This plant forms a moderate-sized *tree* or shrub. *Stem* swelled at the joints. *Branches* numerous and spreading. *Bark* acrid, especially that of the root. The *leaves* are opposite, entire, coriaceous, ovate, with the veining scarcely perceptible. *Flowers* small, and produced in loose leafy panicles, the lower portions being axillary, and the upper part terminating the branchlets. *Calyx* of four sepals, small. *Corolla* monopetalous, four-parted. *Fruit* a berry.

At a meeting of the Asiatic Society in 1844, an interesting paper on this subject was read by Dr. Royle, which confirms the opinion expressed by the previously-mentioned gentleman, that the *Salvadora Persica* is the true Mustard tree of the ancients.

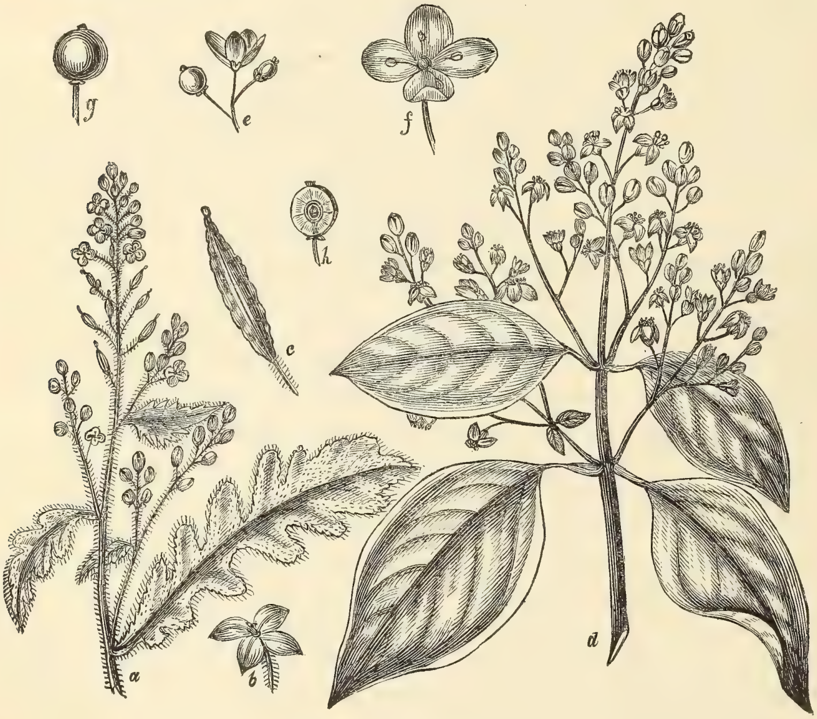
" Dr. Royle stated that he had received his information respecting this plant from a gentleman of the name of Ameuny, a native of Syria, who told him that he knew the Mustard tree well, that the native name was Khardal, and that the seeds were employed there for exactly the same purposes as mustard is with us. Dr. Royle referred to a variety of sources, to obtain some explanation of Khardal, as applicable to a tree of Palestine; but was unable to proceed beyond the Asiatic names of three kinds, enumerated in his manuscript *Materia Medica* of the East. 1, *Khardal*, or Common Mustard; 2, *Khardal barree*, or Wild Mustard; 3, *Khardal Roomee*, or Turkish Mustard. This last was the plant to which he referred. On the Doctor examining the Index of his " Illustrations of Himalayan Botany," he found the word *Kharjal*, as one of the names of a tree in North-west India, apparently well suited to be the Mustard tree of Scripture, though he had no proof that it extended into Palestine. This is the *Salvadora Persica*, first obtained from the Persian Gulf; which is there a tree of moderate size, with drooping branches, and leaves somewhat resembling those of the Olive, with acrid bark and edible berries."

" Dr. Roxburgh describes the same tree as common in the peninsula of India, growing well in every soil, producing flowers and ripe fruit all the year round, with the inflorescence in panicles; the berries red and juicy, much smaller than a grain of black pepper, having a strong aromatic smell, and taste much like garden cresses. Retz had previously obtained the same plant from Tranquebar, and had called it *Embelia grossularia*."

"Forskal found it in Arabia, and called it *Cissus arborea*, stating that it was much esteemed by the Arabs, and even celebrated by their poets. Having traced this tree from India up the Persian and Arabian Gulfs, the Doctor was still unable to find any authority for its being found in Palestine. On inquiry, he was informed by

Dr. Lindley that he had seen specimens of the plant collected by Bové near Mount Sinai. Captains Irby and Mangles also mention meeting with the same plant as they advanced towards Kerak from the southern extremity of the Dead Sea. Mr. Ameuny further informed Dr. Royle that the Khardal is found in the neighbourhood of Jerusalem, and most abundantly on the banks of the Jordan and round the Sea of Tiberias."

"The Doctor concluded his interesting paper, of which we give but a brief summary, by stating, that notwithstanding the absence of authentic specimens, he felt no doubt that *Salvadora Persica* is the true Mustard tree of Scripture, 'as it has a small seed, which produces a large tree, with numerous branches, in which the birds of the air take shelter; that the seed is possessed of the same properties, and is used for the same purposes as Mustard is with us, and has a name Khardal, of which Sinapi is the true translation, and which, moreover, grows abundantly on the very shores of the Sea of Galilee, where our Saviour addressed to the multitude the parable of the Mustard tree.' " *



DESCRIPTION OF THE WOOD-CUT.

a Branch of *Sinapis Kaber*, or Persian Mustard.
b Flower of ditto.
c Seed-pod of ditto.
d Branch of *Salvadora Persica*, or true Mustard tree.
e Flower of ditto.
f Flower magnified.
g Fruit of ditto.
h Section of fruit, to show the seed.

---

* Gard. Chron., 1844,

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE "BOTANICAL MAGAZINE" AND OTHER LEADING PERIODICALS FOR AUGUST.

Acacia ixiophylla. A straggling bush, remarkable for the large quantity of viscid glands and hairs which cover its branches. The flowers are sweet scented, in small yellow heads, seated on short hairy stalks in the axils of the phyllodes. It was raised from seeds presented to the Horticultural Society by Dr. Henderson, from New South Wales, in December, 1844, and requires the greenhouse, thriving in any good rich loamy soil, and flowering freely in March. It is propagated best by seeds, but may be increased by cuttings in the ordinary way.—*Journ. Hort. Soc.* iii., p. 244.

Amygdalus persica, *Sanguinea plena.* This is a semi-double variety of the Peach, with dark crimson flowers, and quite hardy. It is a very fine and handsome plant.—*Journ. Hort. Soc.* iii., p. 246.

Angelonia angustifolia. Narrow-leaved Angelonia, raised from seeds received from Mexico, from Mr. Hartweg. It is a half-shrubby stove perennial, growing freely in a mixture of loam, leaf-mould, and sandy peat, in equal proportions, with plenty of moisture. It is easily increased by cuttings, and produces its deep violet flowers from June to October, but afterwards should be kept rather dry, particularly during winter. It is a very handsome little plant, and one deserving a place in every stove or warm greenhouse.—*Journ. Hort. Soc.* iii., p. 243.

Arisæma Murrayi, *Dr. Murray's Arisœma.* Few of the *Aroideæ* are more worthy of cultivation than the present, of which tubers were sent to Kew by Mr. Law, of Tanna. It was discovered in the valleys of the Bandsda hills, to the south-west of Surat. Reared in the stove, it sends up, in early spring, first the very delicate white inflorescence, and afterwards the leaves.—*Bot. Mag.*, t. 4388.

Bouvardia Cavanillesii, *Cavanilles's Bouvardia.* A small greenhouse shrub, bearing scarlet tubular smooth flowers, nearly an inch and a half long, raised at the Horticultural Society Gardens, from seeds received from Mr. Hartweg in January, 1846, from Mexico. In cultivation it is about as graceful as a *Fuchsia macrostema.* Treat the same as for the old *Bouvardia triphylla,* and if rather stunted, flowers are produced freely from the old wood. It should be kept nearly dry all the winter.—*Journ. Hort. Soc.* iii., p. 247.

Burtonia pulchella, *Beautiful Burtonia.* A charming species raised by Messrs. Lucombe and Pince, of Exeter. It forms a shrub about two feet high, with slender branches, heath-like leaves, and the flowers copious and large, terminating the ramifications. It flowers during the spring and summer months.—*Bot. Mag.*, t. 4392.

Calceolaria cuneiformis, *Wedge-leaved Calceolaria.* Raised from seeds purchased from Mr. Thomas Bridges, in 1846, and said to be from Bolivia. This, in its wild state, is a stiff, short, branched bush, but when cultivated has much larger and softer leaves, and weaker branches. The flowers are about as large as those of *Calceolaria integrifolia,* and of a pale lemon colour.—*Journ. Hort. Soc.* iii., p. 242.

Cirrhopetalum fimbriatum, *Fimbriated Cirrhopetalum.* A rare and most lovely plant, sent by J. E. Law, Esq., to the Royal Gardens, from Bombay, where it is said to be by no means common, growing on Ayeen trees, about Parr and the Rotunda Ghaut. Attached to masses of Sphagnum, and suspended from a rafter of the Orchideous House, it bears its most curious green flowers copiously in April and May.—*Bot. Mag.*, t. 4391.

Episcia bicolor, *Two-coloured Episcia.* A very pretty Gesneriaceous plant, raised from seeds sent from New Grenada by Mr. Purdie. It blooms in the stove, and continues throwing up flowers for several weeks in succession, many growing together among the ample dark foliage, and of white colour, bordered with purple.—*Bot. Mag.*, t. 4390.

Lithospermum canescens, *Hoary Gromwell.* Synonymous with our *Batschia canescens,* t. 151.

Napoleona imperialis, *Imperial Napoleona.* A more than ordinary interest has attached to this plant, arising partly from the circumstances under which the species was discovered, and partly from its name, given in honour of one of the most remarkable men that ever lived, and, still more, perhaps, from the singular structure and colour of the flower. During the month of May of the present year, one of the living plants brought home by Mr. Whitfield in 1843, and purchased by His Grace the late Duke of Northumberland, produced perfect flowers. The flowers are of singular construction, not much unlike those of Passiflora ; the prevailing colour is a rich apricot orange ; each of the outer sepals is marked with a deep crimson purple spot, forming, when the flower is perfect, a basal ring of that colour ; the crown is of a greenish yellow, and very conspicuous. Altogether this plant is of first-rate importance.—*Bot. Mag.*, t. 4387.

Zauschneria californica, *Californian Zauschneria.* Raised from seeds collected by Mr. Hartweg, in fields about Santa Cruz, in California, and received at the Horticultural Society Gardens, May 11, 1847. This curious plant, which it has so long been an object to obtain, proves to be a species of much horticultural interest. It forms a bushy perennial about three feet high, and every branch emits from the axils of all the upper leaves one horizontal bright scarlet flower about an inch and a half long. When in bloom, the plant is in appearance not much unlike a Fuchsia, but the calyx tube has four stout ribs. It grows freely in any good garden soil, and is easily increased by cuttings and seeds. The seedlings flower in the first season in the month of September, if sown in May. It is a fine hardy species, rivalling the Fuchsia, and most probably will flower from June to October, if planted in a warm dry situation, on rock-work.—*Journ. Hort. Soc.* iii, p. 241.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Aganisia pulchella. A charming little plant, and when seen in such fine condition as in this specimen, completely laden with pale straw-coloured flowers, is an object of considerable beauty. We noticed it in the collection of S. Rucker, Esq., Wandsworth.

Agalmyla staminea. We again notice this handsome species in a collection of plants forwarded for exhibition to the Horticultural Gardens by Messrs. Veitch. The plant keeps its character, though we still think it has not yet had the necessary treatment for the full developement of its beauty, so that a fair amount of bloom shall be produced in proportion to the foliage.

Burlingtonia fragrans. Messrs. Rollisson have recently had this delicately-coloured and highly-fragrant Orchid in fine bloom. The latter quality is quite sufficient to create admiration wherever it is seen in flower.

Burtonia villosa. Messrs. Pince and Co., Exeter, exhibited in June last, at the Royal Botanical Gardens, Regent's Park, a new species of Burtonia, with large rosy lilac-coloured flowers ; the specimen being small, no correct idea of its habit could be given ; however, its handsome flowers will make it a favourite with the cultivator.

Chironia glutinosa. We noticed this species last year, as a most promising plant for specimen cultivation, and Messrs. Henderson have had a beautiful plant in fine condition. The flowers are rich rosy lilac colour, about two inches in diameter, well thrown out above the foliage, which is neat, and a rich deep glossy green. The bloom lasts a considerable time longer than any of the other species.

Dendrobium sp. nov. A fine and handsome species ; the habit is much like *D. longicornu*, though the flowers are three or four times as large, and of the purest white, with a spot of rich maize-colour on the lip ; they are produced in pairs, and are very striking and conspicuous. Messrs. Veitch are the introducers and cultivators of the above.

Dendrobium sanguinolentum. A very fine and well cultivated specimen we recently met with in the Gardens of the Horticultural Society, Chiswick. The flowers are pale straw-colour, rendered still gayer by a deep blood-red blotch on each petal. A plant similar to the above is very rarely to be met with in such condition of flower.

Erica ventricosa grandiflora. In the nursery of Mr. Glendinning, Chiswick, in June last, we noticed a specimen of this hybrid Heath blooming finely, and otherwise in good condition. The colour of the flower being a rich carmine added greatly to its attraction, blooming as it does like all the ventricose varieties.

ERICA COCCINEA MINOR. Another hybrid variety we observed, with bright rose-coloured flowers, the limb forming a pure white star, a most prolific bloomer ; both the above are admirable varieties, and worthy a place in every collection of the Erica.

ECHITES SP. NOV. A species introduced by Messrs. Veitch from the Brazils, has pale flesh-coloured flowers, yellow in the throat, about two inches long, spreading at the mouth about an inch-and-a-half, not very handsome, compared with others in cultivation. It has a fine habit, with bright and glossy-green foliage.

GOMPHOLOBIUM SP. NOV. An introduction from New Holland, and flowered for the first time in Messrs. Rollisson's collection at Tooting, in July last. The species has a shrubby habit, with dull green foliage. The flowers, which are a pale though bright yellow, are produced in abundance. No doubt it will be a useful plant for specimen cultivation.

LACÆNA BICOLOR. Mr. Williams, gardener to C. B. Warner, Esq., has flowered the above. The specimen had two long scapes of pale straw-coloured flowers, with some purplish stripes on the lip ; it exhibited the skill of the cultivator more than its own merit, as a handsome and ornamental plant.

MACLEANIA CORDATA. In the Nursery of Messrs. Rollisson we found this species exhibiting flowers of a reddish colour, shading much paler towards the mouth ; they are produced in clusters at the ends of the shoots on a short stem. The foliage is small, and the whole plant was little more than a foot high.

ONCIDIUM SP. NOV. We have received from Messrs. Henderson, Pine Apple-place, Nursery, a specimen of a very handsome Oncid. The flower-scape is thirty inches long, slender and branched, with the bloom set pretty thickly upon it. The ground colour of the three upper petals is rich yellow, strongly marked with brown ; labellum bright yellow, with a few brown spots on the upper part. The lower petals are small, greenish, and spotted with brown. The habit and general appearance of the plant is that of *O. pubes*, the distinction being in the flowers, which are considerably larger and handsomer.

PIMELEA WEIPPUGIANA. Another novelty in the possession of Messrs. Henderson, having globular heads of bloom, pure white, the individual flower considerably larger than generally seen in this section, and of more substance ; the foliage is more robust, as is the whole plant. The specimen, though small, was quite sufficient to indicate its great utility to the lovers of the ornamental and free-blooming plants.

TROPÆOLUM SPECIOSUM. We noticed a fine plant of this ornamental genus in the Nursery of Messrs. Frazer, Lea Bridge Road. This species, from the colour, profusion, and graceful appearance when laden with bloom, will amply repay the cultivator.

TROPÆOLUM UMBELLATUM. A native of Peru, and introduced by Messrs. Veitch ; has small, tubular flowers of a scarlet colour, produced but scantily over the plant. The habit is good and neat.

VANDA TERES. In a collection of Orchids exhibited by Mr. Williams, gardener to C. B. Warner, Esq., we noticed a *Vanda teres* much smaller in flower than the variety in common cultivation; it differs in other respects, the colour is much deeper, while the labellum is void of the rich yellow colour, as well as the brown spots or stripes. The appearance and habit in other respects is the same.

OPERATIONS FOR SEPTEMBER.

The long-continued wet weather has rendered the use of the watering-pot in the open air unnecessary. The cultivator's attention has been chiefly engaged in keeping the flower-garden free from weeds, and staking all the tall-growing kinds in the borders or on the lawn, to prevent the boisterous winds and dashing rains from breaking them down. Several kinds of greenhouse plants, also, which had been placed out of doors, have had to be removed again to the house to shield them from the severity of the weather.

Everything in the flower-garden will now have arrived at some degree of perfection, and should the weather during this month prove fine, a rich display of flowers may be expected. The various kinds of *Anagallis*, *Verbena*, and other bedded plants, should be kept constantly pegged to the ground, otherwise they are either broken by the wind, or, by being twisted, become shabby for the remainder of the season. Freedom from weeds, and general cleanliness, is of great importance; without this the greatest display of bloom is lost, as nothing can compensate for want of neatness.

Always keep on hand a good supply of Scarlet Pelargoniums, Fuchsias, Cuphæas, Salvias, and Verbenas, potted in large pots, and in vigorous growth, to replace any that go out of bloom, or become damaged, so that all parts of the garden may at all times be kept in as perfect a sheet of various-coloured flowers as possible.

With as little delay as the business of the month will admit of, progress with the increase of young stock for next year's blooming in the flower-garden, as the season is now fast passing away. To make sure of having a sufficient quantity, it is advisable to make out a list of what is required and put in sufficient cuttings that, when struck, one-fourth may be allowed to be lost during the winter. Should the winter prove favourable, and a less loss be sustained than usual, the overplus will answer to make up deficiencies, and may always be readily disposed of.

Seeds of different choice kinds of annuals, biennials, herbaceous plants, and others, should be looked after, and gathered the instant they are ripe, as if the weather is wet they will soon be lost.

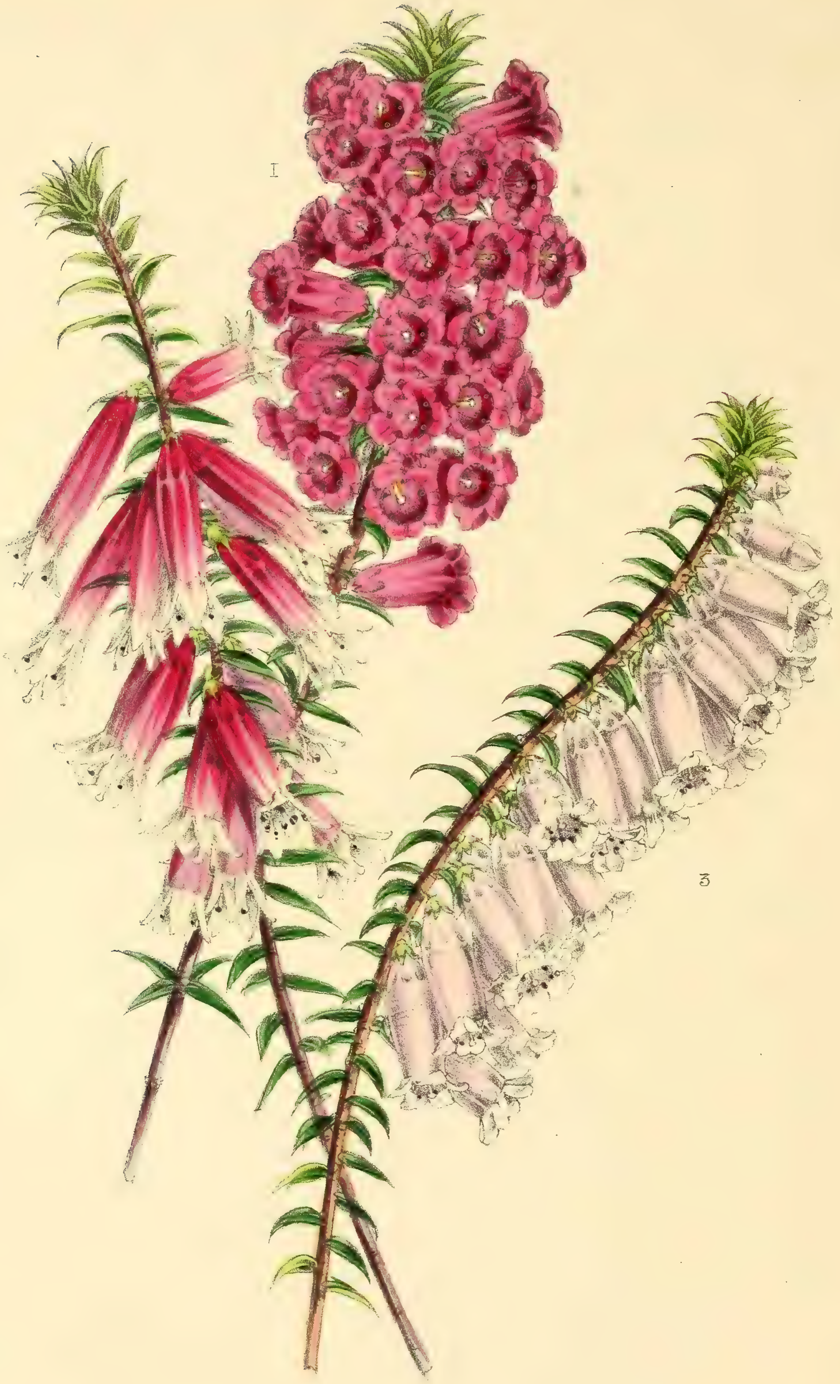
Pot Hyacinths, Narcissi, and other bulbs, also re-pot if requisite, and in every way encourage the growth of Roses, Lilacs, Pinks, and other plants to be forced in the winter; also look well to Camellias, Cupheas, and other winter-flowering plants, which will shortly be in request.

In *frames* the young stock for next year should have as much exposure as the weather will permit, but they must be secured from heavy rains, and must have every encouragement to grow, that the shoots may be matured and hardened before the dark winter months.

In the *greenhouse* give free access to the air, and decline syringing, so that the wood may become hardened and fitted for winter.

In the *Orchid-house* still less shade is required than last month; diminish humidity, admit air freely, but keep up a brisk heat, that the growths may be perfected before the plants are dried off. Those kinds which are still in a state of growth, must receive the usual requisites, but with less humidity than in the hottest months of summer; if convenient, it is best to grow them in a house to themselves, that their treatment may not interfere with those which are preparing for torpidity.

In the common plant-stove, decline syringing, but water liberally at the roots; also give a brisk heat, and plenty of air, to render the newly-formed wood firm and hard; and in every way gradually prepare for the period of rest.



S Holden, del & Lith.

Epacris (hybrid var.)
1 campanulata maxima. 2 bicolor. 3 delicata.

EPÁCRIS.

(1. Campanulata maxima. 2. Bicolor. 3. Delicata.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
EPACRIDÀCEÆ.

(Epacrids, *Veg. King.*)

Generic Character.—*Calyx* coloured, many bracteate, bracts of the same texture as the calyx. *Corolla* a tube, limb beardless. *Stamens* epipetalous. *Anthers* peltate above the middle. *Hypogynous scales* five. *Capsules* having the placentas adnate to the central column.—*Don.*

Epacris campanulata maxima, *Large Campanulate-flowered Epacris.—Plant* a shrub, growing two feet or more high. *Leaves* ovate, acuminate, reflexed. *Flowers* axillary, forming a spike. *Corolla* with a deep rich crimson tube, about twice the length of the calyx, very wide at the mouth, and terminating in fine spreading, acute, paler coloured segments. *Stamens* situate round the mouth of the corolla.

This fine variety of *E. campanulata,* although shorter in the tube of the flower than the species, is nevertheless a very superior production. The colours are truly rich and lively; the plant has a good habit, grows with as much freedom as *E. impressa,* and is a most profuse bloomer. It was raised by Messrs. Low and Son, of the Clapton Nurseries, in whose collection it bloomed for the first time in March, 1848, when our drawing was prepared.

Epacris bicolor, *Two-coloured Epacris.—Plant* an upright shrub, growing from four to six feet high. *Leaves* ovate, acuminate, shining. *Flowers* axillary, drooping. *Corolla* tube wide, campanulate, four times the length of the calyx, of a deep and very rich crimson, terminating in five spreading, acute, yellowish white segments.

This kind greatly resembles, both in habit and appearance, *Epacris grandiflora,* "Mag. Bot.," i., t. 52; but the flowers are of a much larger size, and of a deeper and richer colour than that species. It was also raised at the Clapton Nursery, and must be considered an acquisition.

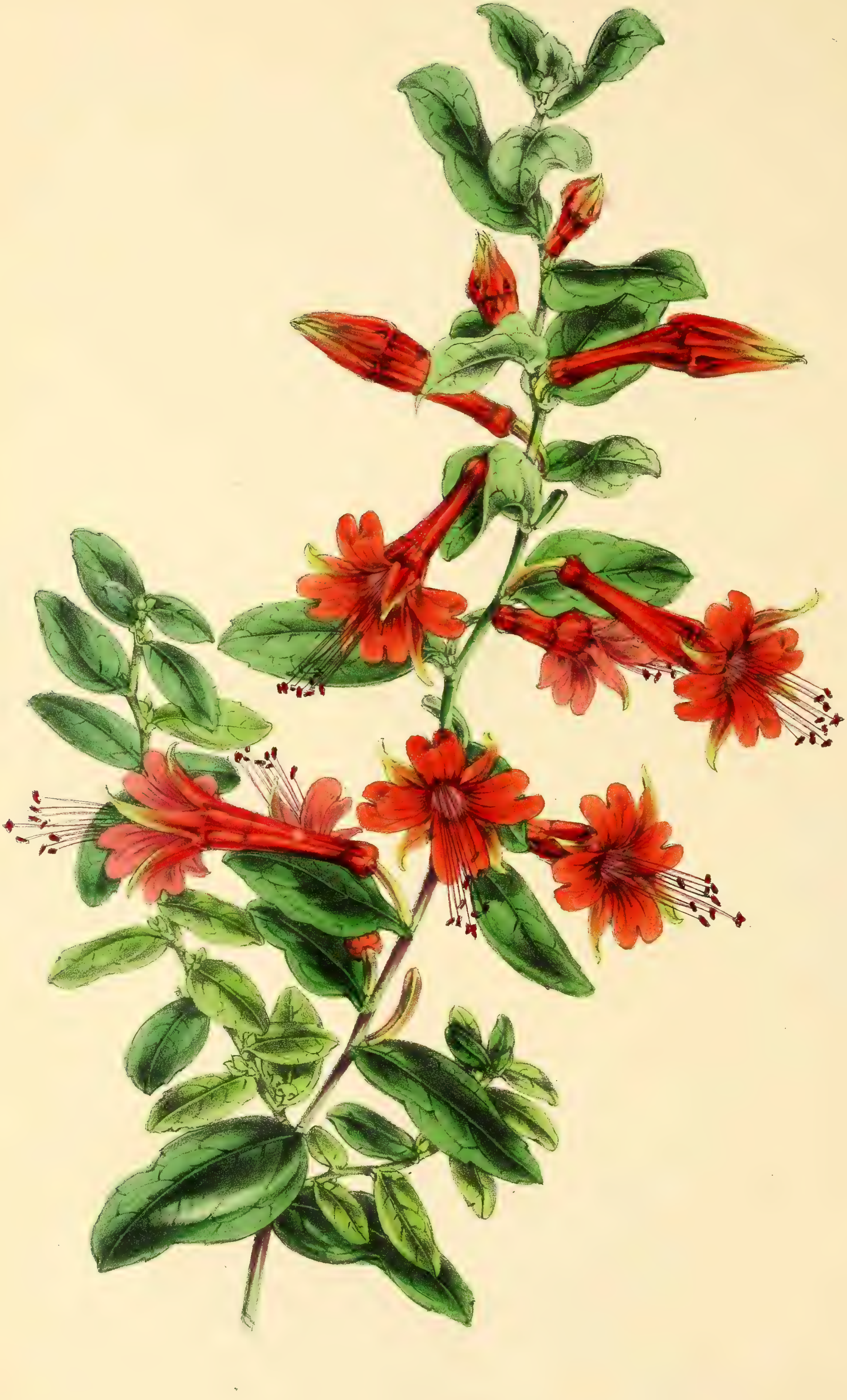
Epacris delicata, *Delicate-flowered Epacris.—Plant* a branching shrub, three feet high. *Leaves* ovate-lanceolate, acuminate. *Flowers* pendulous, very large for the size of leaf. *Corolla* tube four times the length of the calyx, white, slightly tinted with pale rose colour; *limb* divided into five pure white ovate-acuminate segments. *Stamens* situate round the mouth of the tube.

Perhaps for delicate beauty and size of flowers, this variety is almost unequalled amongst *Epacrises;* its growth too is free and graceful, and the produce of flowers profuse.

The management of these plants is precisely the same as that of Cape Heaths, that is, they require the temperature of an airy greenhouse, a sandy heath mould moderately broken, perfect drainage, a good supply of water, and care that neither drought nor burning sunshine injures their tender roots.

Increase is effected by cuttings put in early in the spring; they should be planted in pots of sand, and be covered with a glass, treating them in every respect like those of *Erica.*

The generic name *Epacris* applies to the natural habit of the species to grow on the top of hills; hence the derivation, from *epi*, upon, and *akros*, the uppermost.



S. Holden. del & Lith.

Zauschneria Californica.

ZAUSCHNÈRIA CALIFÓRNICA.

(Californian Zauschneria.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
ONAGRĂCEÆ.
(Onagrads, *Veg. King.*)

Generic Character.—*Calyx* superior, the segments cohering and forming a long tetragonal tube; the limb four-parted, with a valvate æstivation. *Petals* four, inserted in the throat of the calyx, regular, with a twisted æstivation. *Stamens* eight, inserted into the calyx, filaments distinct, extending beyond the flower. *Ovary* four-celled. *Style* filiform. *Stigma* four-lobed. *Seeds* numerous.

Specific Character.—*Plant* a herbaceous perennial, growing about three feet high. *Leaves* ovate, sessile, slightly dentate, opposite on the lower part of the stems, but alternate towards the extremity, hairy. *Flowers* axillary, solitary, drooping, of a bright scarlet. *Calyx* tube with four stout ribs, gradually swelling from the base to the centre; segments of the limb linear-lanceolate, acute, slightly hairy, as long as the tube, deciduous. *Petals* four, heart-shaped, the point of each being fastened within the throat of the calyx, spreading. *Stamens* eight, all fertile; *filaments* much longer than the tube of the calyx in which they are inserted; *anthers* red. *Style* longer than the filaments; *stigma* four-lobed; lobes spreading, covered with fine hairs.

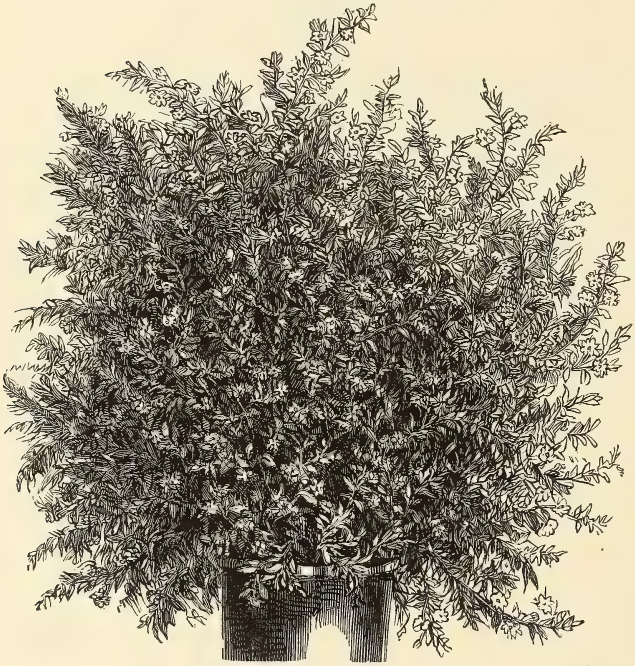
Authorities and Synonymes.—Zauschneria *Presl.* in *Reliquiæ Hænkeanæ*, vol. ii. p. 28, t. 52; *Lindl.* in *Veg. King.* p. 725; Zauschneria californica, *Presl.* as above. *Jour. Hort. Soc.* vol. iii. p. 241.

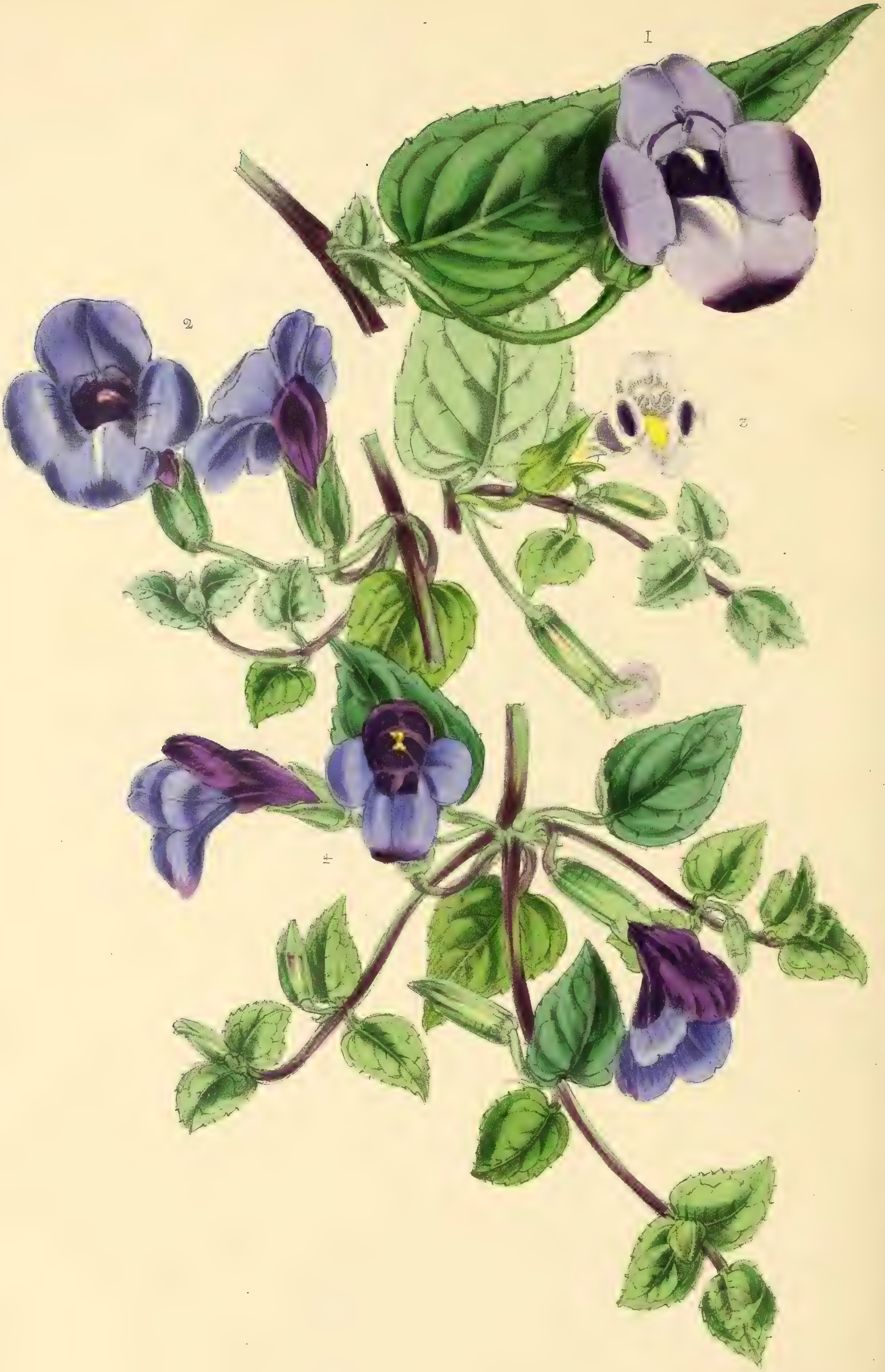
Our drawing of this fine new hardy plant was made in the garden of the Horticultural Society, where it produced its showy flowers in August last. It must certainly be classed amongst our very best herbaceous plants, and when it has become sufficiently increased to admit of general distribution throughout the country, there will be few gardens where this fine ornament will not be grown.

In the "Journal of the Horticultural Society," vol. iii., p. 242, it is stated to have been raised from seeds, collected by Mr. Hartweg, in fields about Santa Cruz, in California, and received at the garden of the Society, May 11, 1847.

The remarks of that excellent Botanist, Dr. Lindley, are as follow:—"This curious plant, which it has long been an object to obtain, proves to be a species of much horticultural interest. It forms a bushy perennial, about three feet high, clothed with ovate, sessile, toothed leaves, resembling those of a Gaura. Every branch emits from the axils of all the upper leaves one horizontal bright scarlet flower, about an inch and a half long. Its general appearance is not unlike that of a Fuchsia, but the calyx tube has four stout ribs. The petals, which are inversely heart-shaped, spread flat; the eight stamens, with red anthers, and a four-lobed stigma, project beyond the flower. The plant grows freely in good garden soil, and is easily increased by cuttings or seeds. The seedlings flower in the first season, in the month of September, if sown in May. It is a very fine hardy perennial, rivalling the Fuchsia, and most probably will flower from June to October, if planted in a warm situation on rock-work."

Grown as a specimen plant for exhibition it may be rendered a fine object. The accompanying vignette will give some idea of its beauty; still its capabilities are yet very imperfectly known, and another season must elapse, before a sufficient knowledge of its habits can be gained, to insure that splendour which it may, perhaps, by first-rate culture exhibit.





S. Holden del. & Lith.

Torenias.

1 Asiatica. 2 concolor. 3 edentula. 4 Arracanensis.

TORÈNIA.

(1. Asiatica. 2. Concolor. 3. Edentula. 4. Arracanensis.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIÀCEÆ.
(Figworts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* tubular, plicate, obliquely five-toothed or bilabiate; lips two or three-toothed. *Corolla* ringent; upper lip bifid, lower one trifid; segments almost flat. *Stamens* four, didynamous; the two upper ones short, with entire filaments; the two lower ones inserted at the base of the lower lip; with arched elongated filaments, which are each furnished with a tooth-formed or filiform appendage at the base; anthers approximating or cohering by pairs, two-celled, cells diverging or divaricate, confluent at the apex. *Style* simple. *Stigma* flattened, bilamellate or simple (?) *Capsule* oblong, shorter than the calyx, two-valved; valves entire, with flat margins; dissepiment parallel, placentiferous, at length free.

AUTHORITIES AND SYNONYMES.—Torenia diffusa, *D. Don. Prod. Flor. Nepal,* 86; Torenia cordifolia, *Benth.* in *Wall. Cat.*, No. 3945; Torenia trians and T. vagans, *Rox. Flor. Ind.*, 3, 96; Bonnaya alata, *Spreng. Syst.*, 1, 41; Henckelia alata, *Link*; Gratiola alata, *Roxb. Flor. Ind.*; Torenia Asiatica, *Sir W. Hooker*, in *Bot. Mag.*, 72, t. 4249.

TORENIA ASIATICA (*Asiatic Torenia*).—*Plant* an annual, with quadrangular stems and opposite branches. *Leaves* opposite, ovato-lanceolate, denticulate, acute, scabrous. *Flowers* axillary, opposite. *Corolla* large, ringent, of a purple-blue colour; *tube* deep purple; *limb* two-lipped; upper lip nearly entire; lower lip three-lobed, each lobe having a deep purple blotch near the outer margin. Two longer stamens with a subulate spur.

A beautiful figure of this fine plant has been given in the "Botanical Magazine," 4249, and it is truly described by Sir William Hooker, as "one of the most lovely plants that has lately been introduced to our stove collections. It seems to have a very extensive range in the East Indies" (where it is a native), "growing throughout Bengal, in Amboyna, Ceylon, Mergui, Chittagong, Sylhet, in the Madras Peninsula;" and, Dr. Wight adds, it is widely diffused in Alpine regions.

It is very easy of culture, merely requiring to be potted in a mixture of sandy loam and peat with good drainage, and the plants placed high in the centre of the pots.

It also forms a good plant for bedding out in warm situations in the flower-garden, where it flowers with great freedom, and spreads over the surface of the ground.

Our drawing was made in the garden of R. G. Lorraine, Esq., in October, 1846.

Torenia concolor (*Self-Coloured Torenia*).—*Plant* a herbaceous perennial. *Stems* acutely tetragonal, prostrate, rather pubescent. *Leaves* petiolate, ovate, subcordate, serrate. *Peduncles* acutely tetragonal, two inches long, single-flowered. *Calyx* oblong, divided into five segments. *Corolla* funnel-shaped; tube deep violet, twice the length of the calyx; *limb* four-parted, widely spreading; segments rounded, upper one somewhat divided, violet colour, rather paler than the tube, and without spots.

This kind is stated by Dr. Lindley in "Botanical Register," 32, t. 62, to have been originally sent to the "Horticultural Society's Garden in 1844, from China, by Mr. Fortune, who found it growing there in marshy grounds on the mountains of Hong-Kong, 2000 feet above the level of the sea. In China it is said to flower in the autumn; and, after the flowering season is over, the dry weather sets in, and the stems and leaves shrivel and remain so during the winter." With us it is a stove-plant, requiring to be potted in the same manner as *T. asiatica;* it thrives best in a humid atmosphere, and when the tops die down, it should be removed to a cooler place, where it can be kept partially dry until it begins to grow again. It is by no means equal to *T. asiatica*, and will not apparently thrive in the open air during summer, as will that species.

Our drawing was made in the nursery of Mr. Glendinning of Turnham Green, in October, 1846.

Torenia edentula (*Purple-blotched Torenia*).—*Plant* an annual. *Stem* weak, erect. *Branches* square. *Leaves* opposite, petiolate, ovate, acuminate, serrated, downy. *Peduncles* axillary, single-flowered, and if terminal, in clusters of several together. *Calyx* ovate, two-lipped, smooth, winged. *Corolla* scarcely longer than the calyx, green, tinged with purple; limb in five segments; lobes rounded, pale purple, with a deep purple blotch on each of the two side ones; two of the stamens exserted.

The flowers of this species, although individually pretty, are by no means conspicuous, being too small amidst so much strong foliage. It is by no means a despicable annual, but will bear no comparison with *T. asiatica.* It is a native of the East Indies, and flowers during the summer and autumn.

Our drawing was made in the garden of R. G. Lorraine, Esq., in October, 1846.

Torenia arracanensis (*Arracan Torenia*).—*Plant* a perennial. *Stems* quadrangular, climbing, very slender. *Leaves* cordate, opposite, serrated, scabrous, with a purple tinge. *Flowers* small, axillary and terminal: when the latter is the case, the flowers are in clusters of four or six. *Calyx* divided into five segments. *Corolla* funnel-shaped, longer than the calyx; *tube* deep purple; limb four-lobed; lobes spreading, rounded, rather paler than the tube.

Our drawing of this newly-introduced species was made from a specimen which flowered in the nursery of Messrs. Rollisson of Tooting, in June 1846.

All the species are increased by cuttings planted in soil or sand and placed under a glass in heat. The generic name is given in honour of Olof Toreen, a Swedish traveller.

ONCÍDIUM SPILÓPTERUM.

(Spotted-winged Oncidium.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

Generic Character.—*Perianth* showy. *Sepals* often undulated, lateral ones sometimes connate with the lower part of the labellum. *Petals* similar. *Labellum* very large, spurless, continuous with the column, variously lobed, tubercled or crenulated at the base. *Column* free, semicylindrical, winged at the top on both sides. *Anthers* usually two-celled; *rostellum* sometimes shortened, sometimes elongated and beaked. *Pollen masses* two, furrowed behind; *caudicula* plain; gland oblong.

Specific Character.—*Plant* an epiphyte. *Pseudobulbs* compressed, oblong, two-leaved. *Leaves* erect, oblong, acute. *Scape* erect, much longer than the leaves, containing seven to ten flowers. *Sepals* small, ovate, acute, free, of a purplish red, with darker spots. *Petals* the same as the sepals. *Labellum* large, three-lobed, almost round; two lateral lobes small, middle lobe purple-red at the base, the broad spreading part clear yellow. *Column* crenulated, somewhat heart-shaped, clear yellow, spotted with purple red.

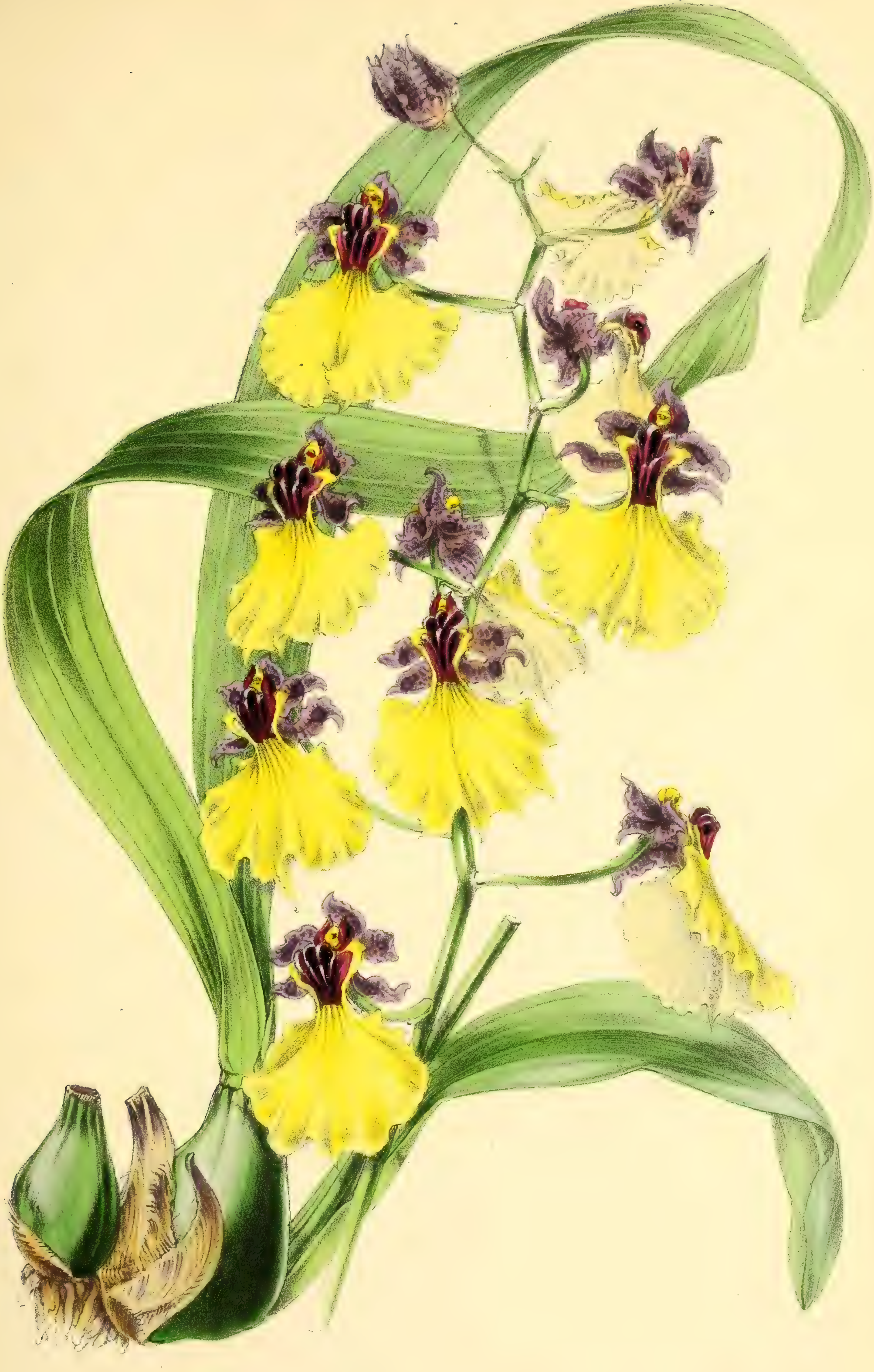
Synonymes and Authorities.—Oncidium spilopterum, *Lindl.* in *Bot. Reg.* 1844, *Misc.* 76, and 1845, t. 50.

For the opportunity of figuring this beautiful species we are indebted to Messrs. Loddiges, in whose nursery it first flowered in July, 1846. It is a native of Mexico, whence it was introduced by those gentlemen in 1844, and is certainly a good kind, deserving to be kept in every collection.

In cultivation its treatment may be the same as that given to *O. Lanceanum*, which this species somewhat approaches in habit. It should be placed in a pot of turfy heath-mould mixed with potsherds, filling the pot half full of drainage, and the soil elevated in the same manner as for *Stanhopeas*. It requires abundance of water and humidity during the season of growth, and must be well shaded from the rays of the sun.

It is a very free flowerer, and grows with great freedom if properly managed; and increase is effected by separating the pseudo-bulbs during the period of rest.

The generic name is derived from *ogkos*, a tumour; the plants belonging to this genus having warts, tumours, or other excrescences at the base of the labellum.



S Holden del & Lith

Oncidium spiloptērum.

CULTURAL CHEMISTRY.

This heading, or title, is selected because the public have been accustomed to consider this science as applicable almost exclusively to the purposes of husbandry. We have heard much of Agricultural, but very little of Horticultural Analyses; and yet if science be of any avail to the former, it cannot be of less importance to the latter. We have therefore chosen to generalise the subject, and shall endeavour to prove that that noblest of sciences, Chemistry, ought to be applied systematically, to the perfecting of the art of cultivation, in the most extended meaning of the term. In so doing it will be the object of the present article, to induce caution on the part of the reader, before absolute credence is given to any theory, however plausible it may appear, and however high the authority of the party by whom it may have been broached. Fortunately, for this purpose, we have just come into possession of one of the most faithful articles that has ever appeared, in the form of a "Lecture delivered before the Royal Agricultural Society," at the late York Meeting, by Professor Johnston.

At a period not more remote than twelve years, little was known of Cultural Chemistry. Sir Humphrey Davy had endeavoured to appeal to it in his Lectures before the Board of Agriculture, but the attempt made little impression. A few books had been written by De Saussure and others, but the practical man knew nothing of them; and, as in Agriculture, so in Gardening, its followers regarded their profession scarcely as a branch of book learning. "The knowledge of it was generally transmitted directly from mouth to mouth; and as it was rarely sought from books by those who practised it, so those who wrote, rarely committed to paper the details of what they had observed, or made their trials with a view to after publication." "And yet," as Mr. Johnston observed, "a precise attention to facts, and a careful record of them is necessary;" for "facts so ascertained and recorded are the very stepping-stones by which any sure advance can be made. Without them no safe opinions can be formed by ourselves, nor can the opinions of others be satisfactorily attested or fairly criticised."

Our readers who possess the early, and succeeding volumes of this Magazine, will do us the justice to acknowledge, that at every fair opportunity we have, while advocating the cause of pure science, been urgently solicitous to obviate the delusive tendency of all those experiments, and the theories founded upon them, which were instituted upon principles not consistent with those of nature, and subversive of the vital function. The practical gardener has little time for reading, and his salary is far too limited, to admit of the purchase of books so expensive, as those descriptive of Chemical Analyses. The amateur, on the other hand, who is eager in the pursuit of knowledge, can by no means undertake a series of experiments upon a thousand subjects, all of which admit of perplexing modifications, any one of which, to be clearly unravelled, might require the labour of a year, with an expenditure of money that would not be prudently contemplated by an individual. "I can assure you," said Mr. Johnston, "that ten long and laborious lives will be insufficient to complete the researches, which the inquiry concerning the variable proportions of *nitrogen* in crops, and the causes of such variation, requires."

The gardener, up to the present period, has not much to lament the paucity of experimental discoveries heretofore made in his profession by chemical researches. If, as is the fact, it stands on record that, in respect to the comparative products of the farm (which, in point of numbers, do not amount to a thousandth part of those of the garden and its appendages), "the differences in the natural produce of different parts of the *same* field," are so great as to warrant the unconditional rejection of the whole, what could be expected were a similar course of analytic experiments applied to the soils, and productions attached to Horticulture? We refer for a detail of tabular results to pp. 212 and 213, No. 21, August, 1848, of the Royal Agricultural Society's Journal.

Some years ago, attempts were made by De Saussure, and others, to ascertain the phenomena of vegetable nutrition, by the exposure of plants, or some portions of plants, to the agency of carbonic acid and other gases, inclosed in bell-glasses; and conclusions were thence drawn, which led to the announcement of a theory that assumed the *appearance* of truth. We say the appearance, because assuredly no correct deductions could be arrived at under conditions so unnatural. Even in our glazed houses and pits, where the laps are open to some extent, and not closed with putty, plants are exposed to the influences of heat modified by artificial means, to light softened and altered by refraction, and to air at least checked in its course, and subject to perpetual alteration in its condition of moisture. In one word, it may be safely asserted, that we have no right to expect trustworthy answers, to questions propounded in a form totally at variance with the natural laws. It has been urged with great propriety, by a writer in the "Mark Lane Express" of Sept. 4th, that chemical science has never yet been applied as it ought to be, since the true science of Agriculture, and of culture in general, is that which points out to us most clearly the different laws of nature.

Liebig's great work first appeared about the year 1839. It was the engine which publicly diffused the theory of *vegetable nutrition* by the absorption of carbonic acid gas, through the oscular pores of the foliage. The doctrine spread with railway speed. Its disciples sprang up like mushrooms, our Institutions and Agricultural Societies swarmed with lecturers, who it is to be feared propagated theories which they did not understand (when *applied* to the physiological structure of plants), which they themselves could not practically apply, and "which were so entirely at variance with all practice, and so unproductive of practical good, that the minds of many who were inclined to be favourable to Science, became prejudiced against it."

And thus it is with everything that involves deep, and interesting inquiries in doubt and perplexity. The food of plants, and the channels through which that food was conveyed into the organism, had long been a subject of physical inquiry; the vessels and cells had been discovered, and to that great man, Thomas Andrew Knight, we were indebted for the suggestion, that " it is through the channels of the cells that the sap ascends." At the same time it was demonstrated, that not one particle of solid matter could by possibility pass into the absorbent vessels. So far, every inquiry bore upon the roots, as the channels of absorption; but when the *theory of introsusception* of gases by the leaves (carbonic acid gas in particular) was broached, it at once became a *sine quâ non*, and as Mr. Johnston observed—the opinion prevailed, and was extensively acted upon by some, that "plants obtain all their organic matter directly from the air; and derive, and therefore required, only mineral matter from the ground;" and in a note he thus quotes Liebig's words:—" The crops on a field, diminish or increase, in exact proportion to the diminution or increase of the mineral substances conveyed to it in manures." Thus, bones were burned in order to destroy their animal matter and mucilage, with a view to retain the dry and indestructible phosphate, and carbonate of lime. "But this mineral-matter opinion has also received its death-blow, and we are again on the old highway of experience taking *theory* into our counsels, appointing him our consulting chemist, but not allowing him to overrule our deliberations."

Ammonia has had vast importance attached to it, since Professor Liebig assumed the lead in the field of Agriculture. It is a natural compound of hydrogen and nitrogen, and assuredly exists in the atmosphere; its elements abound in animal, and in some vegetable substances, and these combine during the process of decay, and are extricated in the form of ammoniacal gas. Modern theory has taught that plants derive all the nitrogen they contain, from the ammonia floating in the atmosphere. " This opinion was so contrary to the oldest, and most common experience of practical men of all grades of intelligence, that nothing but the announcement of it in the form of an undoubted law, could have secured it any degree of permanent consideration, even among scientific men. As it was, sanguine young persons, chiefly such as were unfamiliar with practice, took it up, and warmly maintained it both in this country and abroad. A calm consideration of *facts*, however, is gradually removing this notion from the public mind, and another year or two will banish it from our books."

These facts may be detailed in a very few lines. Ammoniacal gas is of itself destructive when applied to leaves. A Cape Jasmine (*Gardenia*) was infested with the mealy insect. A glass vessel being inverted over the plant in its pot, a drop or two of weak ammoniacal solution was introduced at the bottom. In a few seconds, the entire foliage assumed the richest imaginable dense green. But this beautiful appearance was the precursor of destruction. Time was given to let the vapour act upon the insects, yet the experiment occupied only two or three minutes. The glass was raised, the blue-green of the leaves subsided, and was rapidly succeeded by the withered brown hue of death. Ammonia, then, and indeed every species of gas unnatural to plants, must be viewed with a jealous eye. Manures contain more or less of ammonia, but, to be rendered of any avail to vegetation, they must be incorporated with the soil: *there* they are in their natural position; the moisture of the ground, and every falling shower, liquefy the saline particles of the manure, and thus qualify the doses. Guano, if pure, abounds with salts of ammonia, and these are also soluble in water; hence the gardener who employs this foreign manure with great caution, may derive some advantage by applying it in the condition of a very weak solution. Hence, also, the farmer (as the converse of the former condition) has always found that guano, in the dry way, among tender seeds, does great injury; and also that, in a dry season, it rarely produces any good effect on the land, however it may have been applied. Finally, all experience teaches that the roots are the channels of nutriment, and that if the required quantity of enriching matters be absent from the soil, luxuriance can never be promoted; and moreover, especially if there be any serious deficiency of ground moisture, every appliance to the leaves or parts above the surface is completely ineffectual. In pot-culture, the daily attendant of the plant-houses, requires no philosopher to instruct him how to keep his plants alive. He may, indeed, drench the floors with water; he may fill the entire capacity of his vinery with steam, to saturation; but he is perfectly aware that, although he may thereby obviate the attacks of red spider, and, in a degree, refresh the foliage, he must depend solely upon the moisture of the soil for the preparation and supply of the vital sap. Surely no more need be said upon a subject so plain to the understanding; yet by no means would we dogmatically assert, that the theory of absorption by the leaves is a fallacy. We are sure that facts are adducible, and of hourly occurrence, to demonstrate that the leaves *exhale* watery matter, and therefore that the destruction of any foliage effects a corresponding injury on the vital energy of any plant. But we are not equally certain that vegetables naturally *inhale*, that is, attract and absorb carbonic acid, ammonia, or any hydro-carbon, as nutriment, from the atmosphere; and therefore, being certain on the one important function, but doubtful of the other, we dare not assert as proved, that which has never been seen to exist, and, at the most, amounts only to an opinion of recent formation, based on a few experiments conducted upon principles, and with apparatus, at variance with the natural condition of vegetable existence.

Our subject has grown upon us, and will demand a second article, wherein the aqueous, inorganic, or mineral elements must be considered. At present it must suffice to observe, that Chemistry has proved beyond a doubt, that much of mystery certainly exists, very little of which is as yet clearly unravelled. Organic Analysis has yielded proof, of the infinite modifications which are traceable in the vegetable subject, although the elements revealed are only four. Thus we have just attained the threshold, but have not taken one step in advance beyond it. Fortunately for the gardener, his practical skill has taught him that if he can command a soft and unctuous loam, a mass of pure reduced leaves, and a quantity of heath-mould of two kinds, he can work with confidence of luxuriant results, although he, in common with the greatest philosopher of the land, is profoundly ignorant of first causes.

ON THE CULTIVATION OF THE MANGOSTEEN AND OTHER NEARLY ALLIED SPECIES, AS FRUIT-TREES.

The Mangosteen is the *Garcinia Mangostana* of botanists, and is a native of the Straits of Malacca, but is now cultivated in various parts of the East Indies, and in Java, as well as in its native country. It forms a *tree* about twenty feet high, with numerous *branches* which are placed opposite to each other. The *leaves* are elliptic-oblong, entire, acuminated, seven or eight inches long, and about three broad in the middle, but tapering off towards each end; shining green above, dull olive beneath. The *flowers* are terminal, solitary, and resemble a single rose. The *calyx* is bractless, and consists of four permanent sepals. The *petals* are four, roundish, thick at the base, but thinner towards the margins; of a dark red. *Stamens* twelve to twenty-five, deciduous; *filaments* short. *Anthers* adnate, two-celled, bursting lengthwise behind. *Style* short, crowned by a six or eight-lobed stigma. *Fruit* fleshy, eight-celled. *Cells* one-seeded. It resembles a middle-sized orange, is filled with a sweet and most delightful pulp, and is esteemed in the countries where it is cultivated, as the finest fruit that can be eaten. The rind is not unlike that of the pomegranate; the fruit is crowned with the lobed stigma, and the flavour may be likened to that of the strawberry and grape combined. The inside is of a fine rose-colour, and divided into several cells by thin partitions, much in the same manner as in an orange.

The plant was introduced to this country so long ago as 1789; but as it required a strong heat, the apparatus for supplying heat in those days being very defective, and in consequence never flowering, the plant was only retained in a few old collections as curious, but of very little value.

In the countries where it is cultivated, the trees assume a fine form; their spreading branches and long shining leaves give them a very ornamental character, and they also afford a good shade from the scorching rays of the sun.

In cultivation it requires a light loamy soil, mixed with a little turfy peat, and very rotten dung, if grown in a tub; but if planted out in the border of a stove, good turfy loam, without any admixture, is the best.

The temperature for its growth and fruiting should be a good, strong, and moist stove-heat, and its roots should have access to a little bottom warmth, but not in a sufficient degree to parch and dry the soil. In respect to temperature it will not associate with *Jambosa vulgaris*, *Anona Cherimolia*, *Spondias lutea*, or *Euphoria Litchi*, all which require a house with a moderate heat, and plenty of exposure to the air. The Mangosteen, on the contrary, should be grown along with *Jambosa Malaccensis*, *Mangifera Indica*, and some others, which only produce freely under strong excitement.

Good drainage is essential to the plants wherever they are grown; for although they delight in abundance of water when in a free-growing state, any stagnation will immediately paralyse the energies of the roots, and render the plants unhealthy.

Increase is effected by ripened cuttings, which root readily in sand, under a hand-glass, in heat.

Besides the true Mangosteen, many other species are deserving of culture for their fruit, amongst which may be mentioned the following:—

Horny-wooded Mangosteen (*Garcinia cornea*). This is a stove tree, growing in the East Indies, where it is a native, forty feet or more high; it chiefly inhabits high mountainous districts. The *flowers* are large, like a rose, of a dull yellow, and are somewhat pendulous. The *fruit* is about the size of a plum, and is crowned with a lobed stigma, like that of the true Mangosteen; the colour is a purplish brown outside; within is a mucous pulp, very pleasant to the taste, but much inferior to the true kind.

Morella Mangosteen (*Garcinia morella*). This is the *Mangostana morella* of *Gœrt. fruct.*, ii., p. 106, t. 105. It is also a native of the East Indies, and forms a good-sized shrub, producing abundance of small round fruit, about the size and appearance of a Morella cherry, whence the name; the berry, however, is striated, and crowned with a four-lobed stigma. The flowers are pale yellow, and are produced in abundance.

Camboge Mangosteen, or Gamboge tree, (*Garcinia Cambogia,*) is the *Mangostana Cambogia* of *Gœrt. fruct.*, ii., p. 106, t. 105; and the *Cambogia gutta* of *Linn. Spec.*, 728. This forms a spreading tree, forty or fifty feet high, with large elliptic *leaves;* yellowish, solitary, terminal, sessile *flowers.* The fruit is eight-furrowed, and crowned by an eight-lobed stigma. It is about two inches in diameter, drooping, on a *peduncle* about one inch long; the *rind* is thin, smooth, and of a dull yellow. The *pulp* is succulent, yellow, sweet, and very pleasant tasted, but is apt to stain the mouth of the person eating it. The natives, however, of the East Indies, where it grows, highly esteem it, both at dessert and in their cookery.

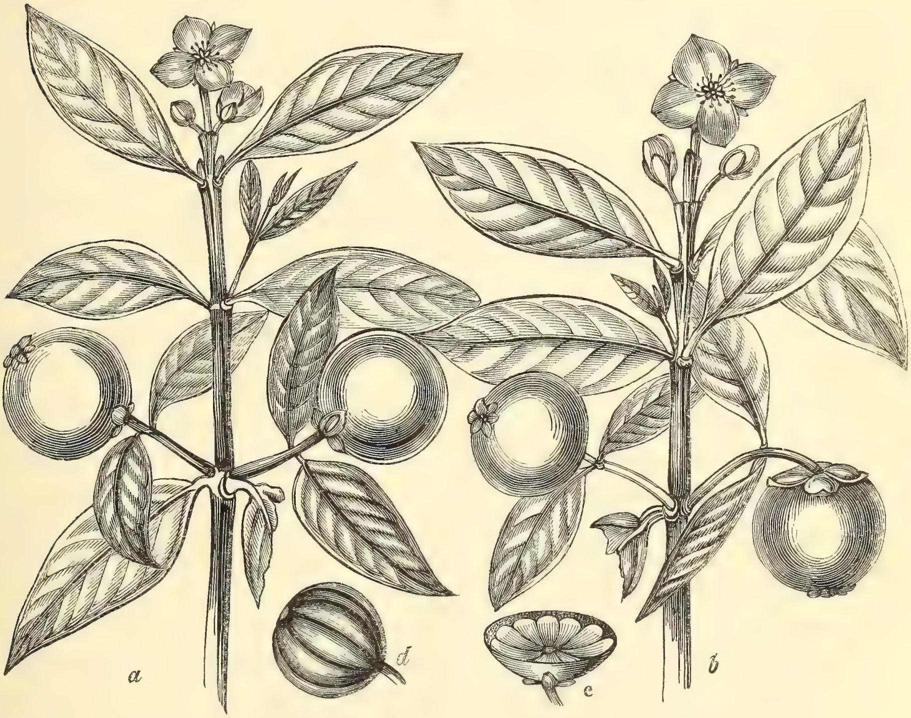
The plant is common about Siam and Camboge, and from the latter province the name Camboge or Gamboge is derived. The natives there make incisions in the bark, and the gum oozes out and is collected by them for exportation.

The Cowa, or Kuwa Mangosteen (*Stalagmitis cowa*). The *Garcinia dioica* of Smith, in *Rees Cyclop.*, v. 15. It is a native of several parts of the East Indies, where it forms a *tree* about twenty feet high. The leaves are large. The *male* flowers lateral, four or five together; *hermaphrodite* ones solitary, terminal, and on short stalks. The *stigma* is entire, and six-furrowed. The fruit is nearly globose, and of a moderately good flavour.

Celebes Mangosteen (*Stalagmitis Celebica*). This is the *Mangostana Celebica* of *Rumph. Amb.*, i., p. 134, t. 44, and *Brindonia Celebica* of *Du Petit Thouars, Dict. Sci. Nat.* v., p. 339. It is said to have been originally a native of Macassar, but it is now found plentifully in a cultivated form in both Java and Amboyna. The tree bears considerable resemblance to the common Mangosteen, and the fruit also, although it is stated sometimes to attain a larger size, but this depends on the situation in which it is grown. The rind of the fruit becomes more yellow than the common Mangosteen, but in other respects (if we except the flavour, which is very inferior) the resemblance betwixt the two fruits is very great.

Amboyna Mangosteen (*Stalagmitis Cochinchinensis*). The *Garcinia Amboinensis* of *Spreng. Syst.*, ii. p. 448. This fine tree is a native of Amboyna, China, Cochin China, and several parts of the Continent of India. The fruit is about the size of an Orleans plum, somewhat pear-shaped, of a reddish colour when ripe. The pulp is acid, very juicy, juice yellow and somewhat viscid, with the fragrance of an apple and not disagreeable to the taste.

The culture of all these species is the same as for the common kind, *G. Mangostana*, but they will thrive with a less degree of heat.



DESCRIPTION OF THE WOOD-CUT.

a Celebes Mangosteen (*Stalagmitis Celebica*).
b Common Mangosteen (*Garcinia Mangostana*).
c Fruit of ditto, cut open.
d Fruit divested of its rind to show the several divisions.

REMARKS ON A FEW SELECT FLOWERING SHRUBS.

As the year is fast advancing towards a close, and the season for making alterations in the flower-garden, forming new shrubberies, and general planting of deciduous, and evergreen trees and shrubs, is at hand, it might be advantageous to mention a few choice and new hardy shrubs, many of which are too little known, and might be easily overlooked or forgotten, by persons desirous of purchasing novelties. Any of the following will prove excellent additions to the already extensive assortment of hardy inhabitants of our pleasure-grounds; and that they may be planted judiciously, and with effect, they are classed in colours, with a short notice of each appended, that the situation and soil may be so selected as to insure success in their culture.

Shrubs with White Flowers.

Abelia rupestris, *Rock Abelia.*—A small trailing deciduous shrub, a native of China. Its flowers are small, almost like those of the honeysuckle, and are exceedingly fragrant. A dry warm situation is required, and its flowers are produced in abundance in autumn. It is increased both by layers and cuttings of the half-ripened wood, planted under a handglass, out of doors.

Deutzia corymbosa, *Corymb-flowered Deutzia.*—This forms a very pretty bush, about four feet high; the flowers are much like those of *D. scabra*, but emit a very agreeable fragrance, not unlike that of *Aloysia citriodora.* It is a native of China, and will thrive in any situation. It is easily increased by cuttings.

Philadelphus mexicana, *Mexican Syringa.*—This plant is a native of the mountains of Mexico. It forms a small slender bush about two feet high, and requires to be planted in a somewhat warm but damp situation, when it produces a profusion of flowers, emitting a very fine perfume. It is excellent for forcing early in the season, and may be increased easily by cuttings of the half-ripened wood, planted under a handglass.

Ribes albida, *Whitish-flowered Currant.*—This species is beyond all comparison the most beautiful of all the pale flowering currants known. The flowers are of the most delicate French white, with a rich pink eye; the racemes are larger than those of *R. sanguinea*, and it is even a more profuse flowerer. It will grow in almost any kind of soil and situation, and is easily propagated by cuttings of the ripe wood, planted in the same manner as the common Currant.

Spiræa vaccinifolia, *Bilberry-leaved Spiræa.*—A Nepal shrub, growing about three feet high, and very pretty when in flower. It thrives best in a shady American border, and is easily propagated by cuttings.

Stuartia pentagyna, *Five-styled Stuartia.*—This is the *Malachodendron ovatum* of our gardens, which was introduced many years ago from Carolina. The flowers are large and cream-coloured, are produced in July and August, and the plant grows about ten feet high, and is propagated by cuttings and layers.

Viburnum macrocephalum, *Large-headed Gueldres Rose.*—This highly beautiful plant was introduced from China in 1844. It is certainly one of the finest hardy shrubs, that has been brought into this country for many years. The clear white flowers are produced in heads almost as large as those of the *Hydrangea hortensis*, and are exceedingly showy. It grows eighteen or twenty feet high, and is increased by cuttings of the half-ripened wood, planted under a hand-glass.

Viburnum plicatum, *Crimped Gueldres Rose.*—This is also a very handsome species, but not equal to the last; the heads of flowers are about the size of the Common Gueldres Rose. The plant is a neat grower, attains the height of eight feet, and blooms profusely. It is also propagated by cuttings.

Shrubs with Yellow Flowers.

Berberis Fortuni and many other kinds are fine plants, and forming low evergreen shrubs are beautiful objects, calculated for dry borders or rock gardens.

Calycotoma spinosa, *Spiny Calycotoma.*—A very pretty shrub, of slender habit, resembling a Cytisus or Genista. Its flowers are produced in June, and it is propagated by seeds. A warm situation and light dry soil are its requisites. It is a native of the South of Europe.

Edwardsia Macnabiana, *Mr. Macnab's Edwardsia.*—A fine handsome shrub, requiring a warm and sheltered situation, and a light, dry soil. Under such circumstances it will flower profusely. It is increased by cuttings.

Forsythia viridissima.—A very ornamental deciduous shrub, growing eight or ten feet high. It flowers early in the spring, before the leaves are unfolded; it is very handsome, will grow in almost every soil and situation, and was introduced from China by the Horticultural Society through Mr. Fortune. It is easily propagated by both layers and cuttings.

Jasminum nudiflorum.—For the particulars of this fine species see "Mag. Bot.," xv., t. 173.

Rhododendron Smithii aureum, *Smith's Golden-flowered Rhododendron.*—A magnificent hybrid, with large rich yellow flowers. Ought to be in every garden where choice plants are an object. It is figured in "Mag. Bot.," ix., t. 79.

Shrubs with Red and Scarlet Flowers.

Azalea obtusa, *Blunt-leaved Azalea.*—This charming species, according to the "Journal of the Horticultural Society," (through which medium alone we are acquainted with it,) may be regarded as the gayest of all the red Chinese Azaleas in cultivation. It forms a little bush, bears a profusion of deep red flowers, and may be propagated by cuttings. A warm situation on the borders should be allotted to it.

Azalea Rawsonii, *Capt. Rawson's Azalea.*—A fine kind, requiring a warm situation. See "Mag. Bot.," iii., t. 123.

Habrothamnus fasciculatus, *Fascicle-flowered Habrothamnus.*—A very handsome but somewhat tender plant, requiring the shelter of a wall, and a light dry soil. See "Mag. Bot.," xiv., t. 193.

Mitraria coccinea, *Scarlet-flowering Mitraria.*—A singularly beautiful plant, a member of a very tender order; will require a warm situation, and the support of a stake. See "Mag. Bot." xv., t. 148.

Rhododendron Standishii, *Mr. Standish's Rhododendron.*—An hybrid of a very superior character, with violet crimson flowers, and a fine compact growth. See "Mag. Bot." xv., t. 55.

Rhododendron barbatum, *Bearded Rhododendron.*—A beautiful deep rose-coloured or rather scarlet species, from the north of India. The trusses of flowers are round, compact, and smaller than the Indian species generally, but are very conspicuous.

Ribes Sanguinea flore pleno.—This kind of scarlet currant blooms later than the old *R. sanguinea*, and also remains much longer in flower than that species. It will grow in any soil and situation, and increases freely by cuttings. "Mag. Bot." xii., t. 121.

Shrubs with Rose-coloured Flowers.

Azalea ovata, *Ovate-leaved Azalea.*—A fine new species introduced from China. It grows in some parts of its native country to the height of eight or ten feet, but on hilly situations it seldom reaches more than two or three. The flowers are produced in great profusion during April and May, and the plant must be grown in a warm and dry situation.

Daphne japonica, *Japan Daphne.*—The flowers of this fine kind emit a very agreeable fragrance. The plant requires to be grown in a warm situation. "Mag. Bot." viii., t. 175.

Escallonia Organensis, *Organ Mountain Escallonia.*—A lovely bush, growing two feet high, and requiring light soil and a dry warm situation. The flowers are a very deep rose, and propagation is effected by cuttings, struck under glass in a little heat.

Habrothamnus corymbosus, *Corymb-flowered Habrothamnus.*—A free bloomer, and more hardy than *H. fasciculatus*. The situation must be dry and warm, and it will be the better for the protection of a wall during the winter.

Indigofera dosua, *Dosua Indigo.*—Sent to the Horticultural Society by Dr. Falconer, from the Botanic Garden, Saharanpur. Its pinnated leaves and racemes of handsome pea-shaped flowers render it a very pretty object. It grows freely from cuttings, and forms only a small and slender bush.

Rhododendron Aprilis.—An hybrid possessing considerable attractions. The flowers are of a very pale rose colour, and are produced abundantly.

Rhododendron chamæ-cistus, *Ground-Cistus Rhododendron.*—A plant with a very dwarf habit, but producing large conspicuous flowers of a pale rose colour. It thrives best in a warm and dry situation, where it is partially shaded from the rays of the sun. "Mag. Bot." iii., t. 169.

RHODODENDRON FRAGRANS, *the Sweet-scented Rose Bay.*—It forms a dwarf shrub, different in aspect from *R. ponticum,* and is well suited for the front of shrubbery borders. The flowers emit a very pleasant fragrance.

RHODODENDRON NILAGIRICUM, *Neelgherry Rhododendron.*—This lovely species will grow in almost any situation or soil. It ought to be in every collection.

WEIGELA ROSEA, *Rose-coloured Weigela.*—Perhaps taking it altogether, a more beautiful hardy shrub than this has not been introduced for many years. For the figure and particulars, refer to "Mag. Bot." xiv., t. 247.

Shrubs with Blue Flowers.

CEANOTHUS PALLIDUS, *Pale-flowered Ceanothus.*—The flowers are paler and somewhat smaller than those of *C. azureus.* It forms however a beautiful dwarf shrub, and will grow in any common light soil, provided the situation be warm. Under such circumstances it will flower freely. Increase is effected by cuttings taken off in the autumn, and planted in light sandy soil under a glass.

CEANOTHUS THYRSIFLORUS, *Thyrse-bearing Ceanothus.*—This is a superior kind to the last; in favourable situations it attains the height of three or four feet, and becomes completely covered with its long thyrses of delicate blue flowers. It will thrive in almost any kind of soil and situation, and is readily increased by cuttings.

CHÆNESTES LANCEOLATA, *Lanceolate-leaved Chænestes.*—We are only acquainted with this plant through Sir W. Hooker, who figured and described it in the "Bot. Mag." t. 4338. We should judge it to be a very beautiful subject for the flower-garden. The flowers are tubular, of a deep blue, and are produced in drooping umbels, during the whole of the summer. If planted in a sheltered place it will attain the height of four or five feet.

VERONICA LINDLEYANA, *Dr. Lindley's Speedwell.*—The flowers of this species, which when kept in the greenhouse are nearly white, become of a much darker colour when the plant is grown in the borders; in the latter situation it is very ornamental, but should be favoured with a warm situation. A figure and description will be found in "Mag. Bot." xii., t. 247.

Shrubs with Lilac Flowers.

AZALEA SQUAMATA, *the Scaly Azalea.*—We are acquainted with this fine Chinese species of Azalea through Dr. Lindley, who figured it in the "Bot. Reg." vol. xxxiii., t. 3.—"It flowers without leaves, producing at the end of every little shoot a large solitary flower of a clear rosy lilac colour, distinctly spotted with crimson. The habit is dwarf, and a warm and sheltered situation is requisite for it to thrive well. Increase is effected by cuttings."

DAPHNE FORTUNI, *Mr. Fortune's Daphne.*—A deciduous species, very handsome. It forms a dwarf shrub two or three feet high. In March and April the flower-buds expand, and the plant becomes completely covered with its lilac blossoms. The cultivation is easy. A loamy and well-drained soil, full exposure to the sun whilst forming and ripening its wood in summer, and rest during the winter when the branches are naked, are the requisites. It will very likely prove a good forcer.

Paulownia imperialis, *Imperial Paulownia.*—This is a native of Japan, and one of the finest of Dr. Siebold's introductions from that country. It grows to a tree, thirty or forty feet high, producing its flowers in terminal panicles after the manner of those of *Catalpa syringifolia.* Unless planted in a well-drained and exposed situation the shoots are liable to become too succulent, and are then injured by the slightest frost; but if grown hardily, it endures our winters very well. For a figure and description of this fine plant, refer to "Mag. Bot." x., t. 7.

Rhododendron campanulatum, *Bell-flowered Rose Bay.*—A more superb species of Rhododendron than this makes when planted in the borders, can scarcely be conceived. It attains the height of five or six feet, and may be planted in almost any situation, provided the soil be light and well drained. Propagation is effected by layers, and grafting on the stocks of *R. ponticum*, or any other hardy kind.

GOPHER WOOD OF THE ANCIENTS.

Whatever timber is meant by the term *Gopher* Wood is uncertain; the only notice we have of it under this name, is in the Sacred writings, and it is mentioned in connexion with the building of the Ark, or large ship, which was to preserve a remnant of animate nature from the devastating deluge. There is little doubt but the wood was well known to the ancients, if not the trees which produced it, and it is not at all improbable but it was one of a tough and very durable texture, such as would be likely to combat successfully with the boisterous waves, and mighty rush of waters, over the surface of which it was destined to bear its important burden. And as the name does not occur, as far as is known, in any other of the writings of the ancients, it is most likely it had another and perhaps a more common name by which it was generally known in the ages after that sad calamity.

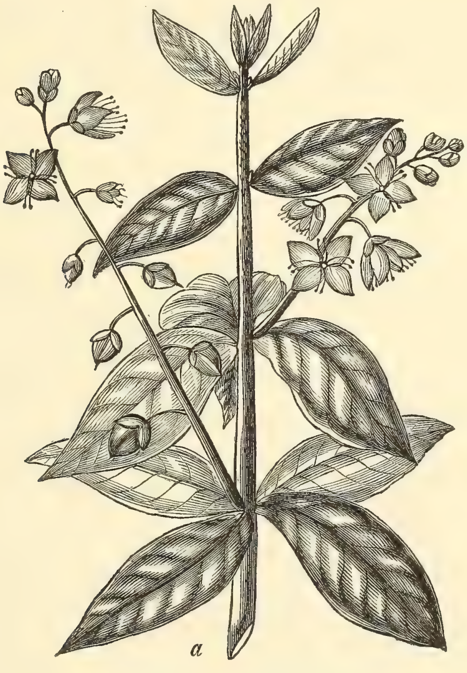
One supposition respecting the tree is, that it is the plant known at present to us under the name of Henna or Hennè, the *Lawsonia alba* of botanists, which plant is found over Egypt, Persia, India, and even in America, in all which places it is highly esteemed, and in Egypt and contiguous countries is much cultivated.

It forms a large *shrub* which, whilst young, is perfectly smooth; but when it becomes older, many of the branches become stunted, and form spines. The *leaves* are entire, opposite and lanceolate. The *flowers* are white, and disposed in panicles. The *calyx* is four-parted, spreading, and permanent. The *petals* are four, obovate, clawed and spreading. The *stamens* eight, approximating by pairs, which alternate with the petals. *Ovarium,* sessile. The *Lawsonia inermis,* and the *L. spinosa* of

Linnæus, are believed to be the same plant, of different ages; and there is pretty evident proof that some of the ancients alluded to the plant under the name of *Cypress*.

It affords the Henna or Al-hennah of the Arabs, which is a paste made of the powdered leaves, and is used both by them, and the Egyptians and Turks, to dye their nails, their horses' manes, skins, and morocco leather, of a tawny or reddish-yellow colour. This practice of dyeing may be traced to high antiquity; the nails of mummies having been so dyed. It is very probable it was used as a mark of dignity, and not merely to heighten the beauty, as the use of it was forbidden to slaves. The flowers have, to Europeans, a very disagreeable odour; but the scent is esteemed by Oriental ladies.

The plant was introduced in 1752, although it is now seldom seen in collections. It requires the heat of the stove, and may be propagated by cuttings of the half-ripened wood planted in pots of sand, and placed under a hand-glass in heat.



a. Lawsonia alba, showing the inflorescence.

Bochart and others, however, believe the Gopher Wood to be nothing more or less, than the common Cypress (*Cupressus sempervirens*), which is a native of the Islands of the Archipelago, particularly Candia (the ancient Crete) and Cypress. It is also "a native of Greece, Turkey, Persia, and Asia Minor." Although with us it only becomes a neat-growing shrub, yet in the countries above named it grows to so large a size, that planks can be sawn, when freed from sap-wood.

three feet or more broad. It was well known to both the ancient Greeks and Romans, and the timber was used for coffins, statues, massy doors, and all other purposes where great strength and durability were required; and of the latter we have, in different countries, some of the most striking examples.

Probabilities are in favour of this latter plant being the Gopher Wood of the ancients. First, Because, although the wood of *Lawsonia alba* is close-grained and very durable, yet we have no account that in any country where it is found, it ever arrives at anything more than a tall shrub, and seldom beyond ten or twelve feet in height, nor does its timber seem to have been used for any very important purposes; whereas, on the contrary, the Cypress will attain the height of seventy or a hundred feet, with a stem sufficient to yield boards of good timber three feet or more broad. Secondly, As the timber of the *Henna* plant (*Lawsonia alba*) would scarcely ever exceed a few inches in diameter, boards of such small dimensions would scarcely seem calculated to use in the construction of so large a vessel as the Ark of Noah is described to be. Thirdly, As the Cypress grows to a very large size in most Eastern countries, and furnishes large timbers, which was used extensively by the ancients, it appears a very likely kind to be selected for a purpose of so much importance to mankind.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE "BOTANICAL MAGAZINE" AND OTHER LEADING PERIODICALS FOR SEPTEMBER.

Gmelina Rheedii, *Rheede's Gmelina.* From the stove of the Royal Gardens of Kew, where it has been so long cultivated that the period of its introduction is not known, nor does it appear (probably from not having previously blossomed) to have been recognised as a *Gmelina.* It flowered in May, 1848. The flowers are produced in *thyrses,* large, handsome, bracteated; the corolla being large, and of a dark tawny yellow.—*Bot. Mag.,* 4395.

Hoya imperialis, *Imperial Hoya.* Dr. Lindley does not say too much of this plant when he remarks, in the "Bot. Reg.," 1846, fol. 68, that this "is the most noble climbing plant we have ever seen." A cluster of its flowers is indeed one of the most striking objects; the leaves, too, are large and handsome. It is a *Hoya* with glossy, fleshy leaves, of a deep, purplish chesnut colour, having the expanded flowers full three inches in diameter! rendered more conspicuous by the ivory white of the central column of fructification. It was discovered in Borneo by H. Low, jun., Esq., who sent living plants to the Clapton Nursery, where it was purchased by Messrs. Lucombe, Pince, and Co. It requires a strong rich soil, in order properly to bring out its numerous large thick flower-trusses, which are produced from different parts of its twining stem. We have used a compost of equal parts of loam, rotten leaves, and peat, with some flakes of dry half-decayed dung intermixed, and a liberal supply of sand and broken crocks blended with the whole. Each individual flower lasts a very long time in bloom, and is highly fragrant in the evening and all the night.—*Bot. Mag.,* 4397.

Leuchtenbergia Principis, *Noble Leuchtenbergia.* Few persons on viewing this plant when destitute of flowers would imagine it to belong to the *Cacteæ.* The mamillæ have rather the appearance of the leaves of some Aloid plant, while the stem, looking as if formed of the persistent cases of old leaves, resembles that of some *Cycadeæ.* The blossoms, however, differ in no particulars from that of *Cereus.* The flowers are yellowish-white, and are produced during the summer months.—*Bot. Reg.,* 4393.

NEW, RARE, OR INTERESTING PLANTS, IN FLOWER, IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Achimenes Kleeii—named after Charles Rudolph Klée, Esq., the Prussian Consul-general in Guatemala, to whom we are indebted for a great many of the fine plants lately introduced from that country. This species Messrs. Lane, of Berkhampstead, received from Mr. Skinner in June last, and it promises to add another great attraction to this gay race. The flowers are of a rosy lilac colour, deeper in the centre, with a small dash of yellow in the throat; the habit is neat, and every way qualified to vie with any of its compeers.

Angelonia moschata. This species we saw in a collection of plants belonging to Messrs. Veitch, in July last, at Chiswick. It differs very little, either in size, shape, or colour of the flower, from others in cultivation, but possesses another quality, that of having a strong odour of musk. In habit it is much larger than the other varieties, and of stronger growth.

Amaryllis, sp. nov. We recently noticed at Messrs. Henderson's nursery, Pine-apple Place, a remarkably fine Amaryllis, both for size of flower and brilliancy of colour, the latter being a rich scarlet. The stem was about three feet high, headed with a large truss of flowers. The plant has a noble appearance. We likewise noticed a new *Begonia*, named, from its colour—

Begonia aurantiaca. From what we could learn, it is a native of India, and most probably will prove one of the handsomest of the tribe. The flowers are of the brightest orange, large, and well expanded, apparently produced copiously. It is a bulbous-rooted species, neat in growth, good foliage, of a rich, glossy green, slightly marked at the edges with a reddish colour. The flower-stem rises several inches, so that the blooms are thrown out beyond the foliage.

Cuphea purpurea. This singular plant we noticed in flower in the nursery of Mr. Low, Clapton. In habit and shape of flower it resembles *C. miniata*, the difference being in the colour of the flower, which is a bright rosy purple. No account of its history is known, whether a species or only a hybrid variety; most probably the latter, as we found it blooming in the open border in the nursery of Messrs. Knight and Perry, Chelsea, under the name of *C. hybrida*, which most likely tells the true history of its origin.

Miltonia spectabilis. We have again to record a specimen of fine cultivation at the nursery of Messrs. Rollisson, Tooting, of this delicate yet most handsome species. The plant was three feet in diameter, completely laden with its beautiful flowers, amounting to upwards of eighty in number. In addition to its beauty, it has the character of being the most permanent of its race when in flower.

Miltonia, sp. nov. In the nursery of Messrs. Veitch and Son, Exeter, we lately noticed a *Miltonia*, somewhat resembling *M. Clowesii* in flower; differing principally in the colour of the petals, which were of a pale brown colour, with large blotches of deep rich brown, which were surrounded by a ring of paler colour than the ground, the lower half of the lip white, while the upper was a rich purple colour. The habit is much finer than *M. Clowesii*, and a brighter green. The scape was upwards of two feet long, and had a liberal amount of bloom. We likewise noticed—

Rhododendron Javanicum, flowering finely. This is certainly one of the finest plants of recent introduction, and as it blooms most freely, will be the greatest ornament of our Conservatories. We understand from Messrs. Veitch that there are several varieties of the Java species—one, a bright yellow colour, has already been published; this, however, is the true one, having large trusses of the richest orange; the nearest resemblance to it in colour is the blood-orange of Spain. Messrs. Veitch received a dried specimen, having upwards of thirteen flowers on a truss; an individual flower being nearly three inches in diameter, some idea may be formed of its beauty, when grown into specimen plants. We noticed plants not more than a foot high, showing bloom; adding the beauty of its bright glossy green foliage, slightly tinged at the edges with red, to the colour of the flower. We consider that it will take the place of the finest of the Rhododendron species.

Thunbergia Doddsii. We have been favoured with a specimen of the above, bearing foliage beautifully variegated with the fine flowers of *T. aurantiaca*, and we are informed by Mr. Dodds, gardener to Colonel Barker, Salisbury, that he raised it from seed gathered from *T. aurantiaca superba*, in 1847; grows quite as free, and is perfectly constant. We think it a novelty worthy of extensive cultivation with the other varieties.

Zauschneria Californica. Although we figure this species, we cannot avoid recording in this place the handsome specimen grown in the Gardens of the Horticultural Society, a vignette of which is given, but from its minuteness, scarcely gives a proper idea of the plant; however, it is most easily cultivated, and capable of being formed into most noble specimens, and will completely supersede the *Gardoqua Hookerii,* which it most resembles in every way, except the difficulty of cultivation.

OPERATIONS FOR OCTOBER.

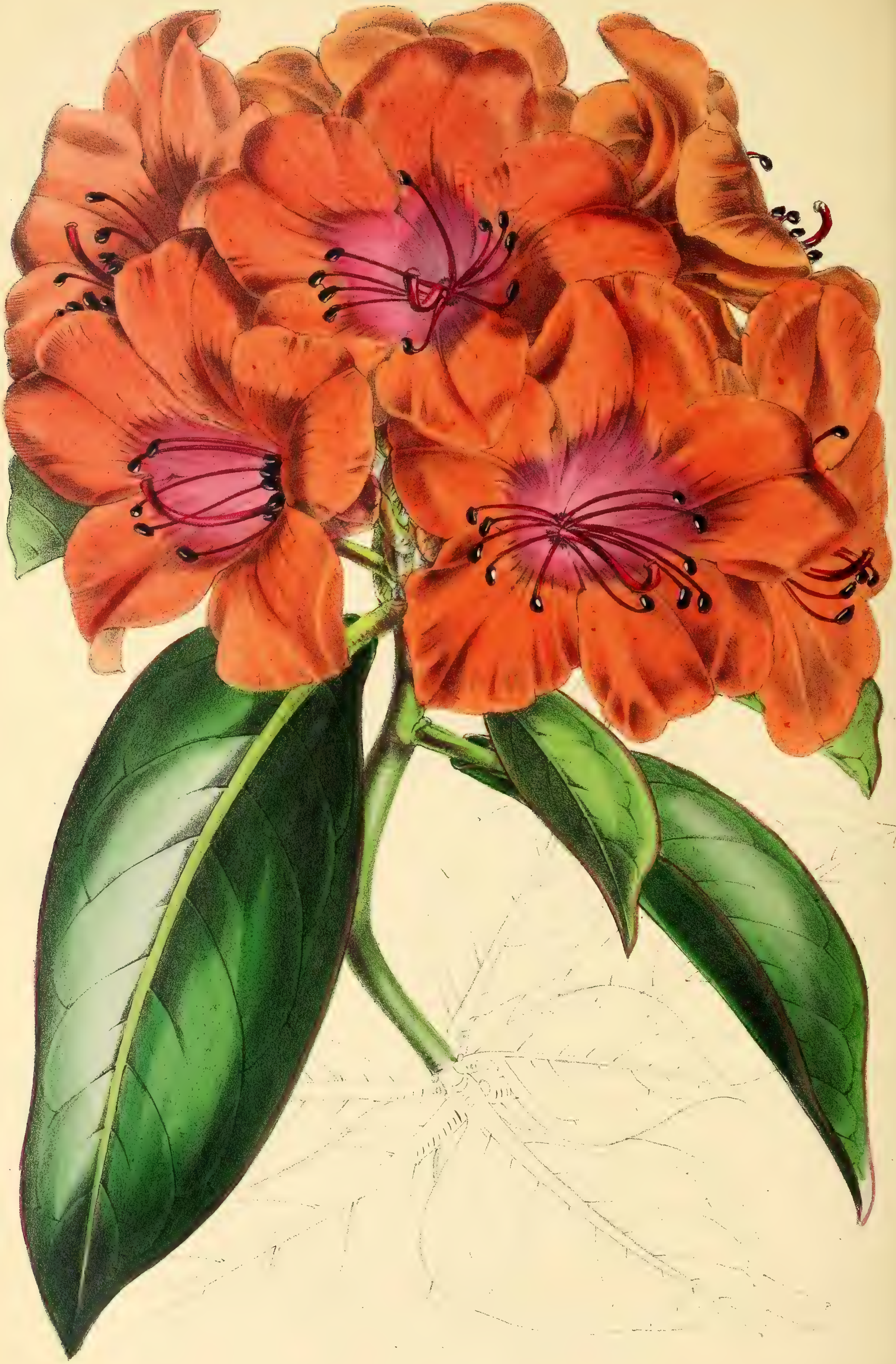
The beauties of the flower-garden are gradually disappearing, and frosts may be daily expected whose effects will destroy the greater part of its attractive character. Now is the time to commence ground-work alterations. Planting evergreen and deciduous shrubs and trees, too, should (if the soil of the garden be light) be performed now in preference to spring, not because plants will not thrive equally well when removed in spring as now, but generally this latter season is over-crowded with business, and the attention which it is desirable to give them after being newly-planted often becomes rather burdensome. Bulbous plants, as Tulips, &c., are always better for being planted before November, if it can possibly be done. The routine work consists chiefly of trimming plants whose stems are dying down; taking up those which will require housing for the winter; sweeping away falling leaves; cleaning, mowing, and rolling, so as to secure a good smooth grass surface for winter.

In *frames* a variety of things will need shelter, to preserve for next summer's decoration of the flower-borders. Where shoots of Verbenas and other plants grow long and fleshy, nip the ends off with the finger and thumb. Give abundance of air, and, except in severe weather, let this be continued throughout the night, but never allow the plants to be injured by frosts or excessive wet.

In the *greenhouse* many plants will be coming into flower: this department, as the open air beauties decline, will become daily more interesting. *Camellias* may be watered occasionally with a very weak liquid manure—a strong potion would very likely bring off the flower-buds; it is not well to crowd the plants together at this time of the year especially, the light having much declined. *Chrysanthemums* will now begin to ornament the conservatory: a little weak liquid manure given to them will be a great assistance to their flowering fine. All *watering* in this department is now better done in a morning. *Ventilation* should be on a liberal scale; whenever the nights are fine, air may be let in continually; this will enable the growths to acquire hardness, and be more capable of enduring the dark days of winter. *Cinerarias* should be set in as light a place as possible, to encourage their progress, that those intended to flower early may have an opportunity of growing strong. Chinese Primroses should also stand near the glass, but it is not necessary that they should have so much light as some other plants. Allow the inmates of this department generally to go gradually to rest, by giving less water than usual, and keeping the temperature sufficiently cool.

In the *Orchid-house,* many Orchids will be ripening, and should be subjected to a partial drought and a cooler temperature. Amongst these may be mentioned species of *Catasetums, Cychnoches, Marmodes, &c.* Some kinds will now be coming into flower, and must receive the usual requisites of heat and moisture. It must always be remembered that none of these plants will endure being removed from a high to a low temperature, unless they are previously prepared by introducing them gradually to a cool and dry treatment.

In the *stove* and *forcing-pits* a multitude of plants will soon be in bloom, as various species of *Begonia, Euphorbia Jacquiniflora,* two or three species of *Gesnera,* &c. Care must be taken not to overload the air with moisture at this time of the year, nor allow the heat to be very strong. Several kinds of dwarf-flowering shrubs should now also be introduced to a little gradual warmth; amongst which may be mentioned *Weigela rosea, Jasminum nudiflorum, Abelia rupestris, Deutzia corymbosa, Philadelphus Mexicanus;* and perhaps *Forsythia viridissima* may prove an useful plant for this purpose.



S. Holden, del. & Lith.

Rhododendron Javanicum.

RHODODÉNDRON JAVÁNICUM.

(Java Rose-bay.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
ERICÀCEÆ.
(Heath-worts, *Veg. King.*)

Generic Character.—*Calyx* five-parted, or five-toothed. *Corolla* somewhat funnel-shaped, or campanulate; rarely rotate or five-parted; limb five-cleft, somewhat bilabiate; upper lip broadest, usually spotted. *Stamens* ten, usually exserted, declinate, sometimes from five to nine are abortive. *Anthers* opening by two terminal pores. *Capsule* five-celled, five-valved; rarely ten-celled and ten-valved, with a septicidal dehiscence at the apex. *Placentas* simple, angular. *Seeds* compressed, winged.

Specific Character.—*Plant* a shrub, growing about six feet high, parasitical. *Branches* spreading, numerous. *Leaves* scattered, somewhat coriaceous, oblong-lanceolate, acute, tapering at both ends, entire, smooth, deep glossy green above, beneath paler, and clothed with fine brown peltate scales. *Flowers* very showy, disposed in fascicles; each cluster consisting of ten or twelve, or even more, terminal. *Calyx* very small, five-lobed. *Corolla* large, very showy, deep rich orange-coloured, somewhat campanulate; *limb* nearly equal; *segments* obovate, rounded, obtuse. *Stamens* ten, five lying against the corolla on one side, and five on the other. *Anthers* purple. *Ovary* oblong, five-lobed.

Authorities and Synonymes.—Rhododendron, *Lin. Gen.*, No. 548; Chamærhododendros, *Tourn. Inst.*, t. 373; Vireya, *Blume, Bijdr.* p. 854; Rhododendron Javanicum, *Bennett, Plan. Jav. Rarior.*, p. 85, t. 29, *De Candolle, Prod.*, v. 7, p. 721, *Sir W. Hooker*, in *Botanical Magazine*, t. 4336; Vireya Javanica, *Blume, Bijdr.*, p. 854, *Don's System*, v. 3, p. 848.

This is certainly one of the most splendid plants of recent introduction, and as it blooms most freely throughout the greater part of the year, a finer ornament to our conservatories can scarcely be conceived.

It is a native of Java, where it occupies various localities in the dense forests, four thousand feet or more above the level of the sea. It was originally discovered by Blume at the foot of Mount Salak, where it was called by the natives *Gaga Mirha*: it was named by that botanist *Vireya Javanica*, in honour of M. Virey, a French physician; but the differences in the construction of the flowers of this genus and Rhododendron, appear too slender to admit of its being satisfactorily established as a new genus; these differences merely consisting of the stamens being in no way adnate to the corolla, and the calyxes being unusually small. We have therefore considered it a species of Rhododendron.

There are several varieties of this fine species known in Java, differing chiefly in the pale yellow or deep orange of the flowers; one of a smaller growth and of a pale citron colour was noticed and described by Blume, and another of a fine orange-yellow, was recently discovered, along with our present subject, by Mr. Thomas Lobb, and was flowered by Messrs. Veitch and Son, the introducers, and beautifully figured by Sir William Hooker, in the "Botanical Magazine," t. 4336.

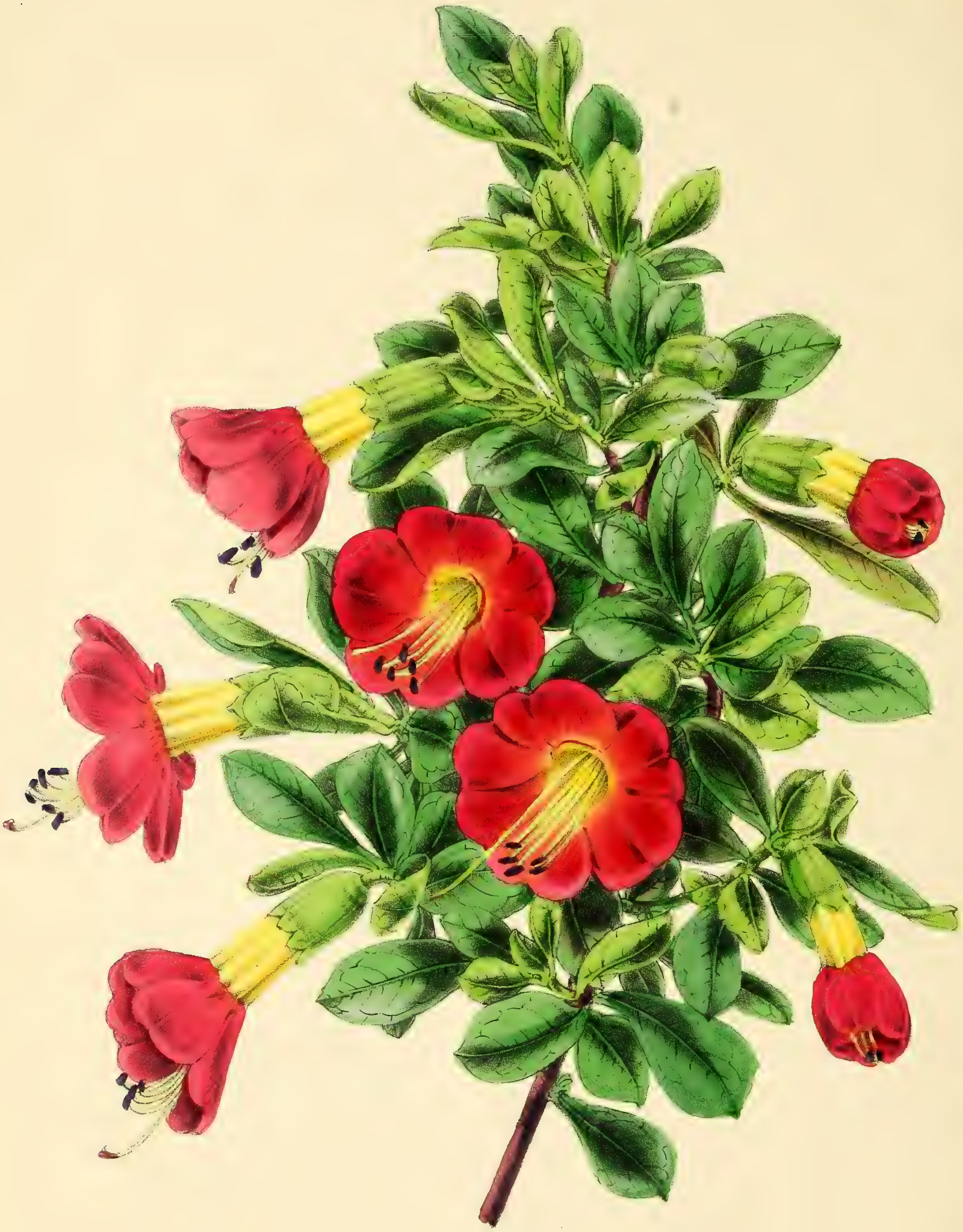
Our plant, which is supposed to be the true *Vireya Javanica* of Blume, has blossoms of a much deeper orange than the one figured in the "Botanical Magazine," and the hue is so rich that the flowers themselves must be seen for an adequate idea to be formed of their splendour.

Messrs. Veitch received a dried specimen having upwards of thirteen flowers in a truss, an individual flower measuring about three inches in diameter. In the nursery of these gentlemen, at Exeter, we noticed plants not more than a foot high, showing abundance of bloom.

It requires the temperature of a greenhouse, and the same treatment as that given to *Rhododendron arboreum* and its hybrids, and is increased by layers, or grafting upon other stocks.

Our drawing was made in the nursery of Messrs. Veitch, Exeter, in Sept. 1848.

The generic name is derived from *Rhodon,* a rose, and *dendron,* a tree, in allusion to the inflorescence.



S. Holden del & lith

Cantūa bicolor.

CÁNTUA BICOLOR.

(Two-Coloured Cantua.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
POLEMONIÀCEÆ.

Generic Character.—*Calyx* urceolate, or with a campanulate tube, five-toothed, or cleft to the middle in three or five parts. *Corolla* tubulose, somewhat funnel-shaped, three times larger than the calyx; *limb* five-lobed, only partially spreading; *lobes* obcordate, nearly equal, convolute in æstivation. *Stamens* inserted in the tube near the base, exserted. *Disc* short, fleshy. *Ovarium* many-seeded. *Capsules* coriaceous, three-valved.

Specific Character.—*Plant* a shrub, four to six feet high. *Branches* numerous, downy. *Leaves* alternate, petiolate, fringed with soft hairs round the margins, and tomentose beneath, cuneate oblong, mucronate. *Corymbs* terminal. *Flowers* numerous, large, very showy. *Pedicels* half an inch or more long. *Calyx* cylindrical, ovate, green, two-lipped, one lip with two, the other with three ciliated teeth. *Corolla* funnel-shaped, about an inch and a half long, spreading at the mouth to about the same in diameter. *Tube* longer than the calyx, of a bright rich yellow; *limb* somewhat spreading, of five ovate oblong segments of a fine carnation red. *Stamens* much longer than the corolla. *Filaments* curved. *Anthers* oblong, yellow. *Style* longer than the stamens.

Authorities and Synonymes.—Cantua, *De Candolle;* Periphragmos, *Ruiz et Pav., Flor. Peruv.* 2, p. 17; Cantua tomentosa, *Cav. Icon.*, 4, p. 43, t. 364; Periphragmos dependens, *Ruiz et Pav., Flor. Peruv.* 2, p. 18, t. 133; Cantua dependens, *Pers., Ench.* 1, p. 187; Cantua buxifolia (?) *Juss., Ann. Mus.* 3, p. 118, t. 8.

This very beautiful greenhouse plant is a native of Peru, from whence it has been recently introduced by Messrs. Veitch and Son of Exeter, through their collector, Mr. William Lobb, who discovered and sent the seeds, in 1846.

It is one of the most showy of all Polemoniaceous plants, and its habit as a shrub is very neat and compact; the foliage is of the most lively green, and the flowers are rich in colour, and produced in the greatest profusion; altogether, it is one of the most valuable of recent introductions.

Seven or eight specimens of *Cantua* have been discovered and described by various authors, but our present subject and *C. pyrifolia* are the only two at present known in our collections, and both have been introduced by Messrs. Veitch through the same collector.

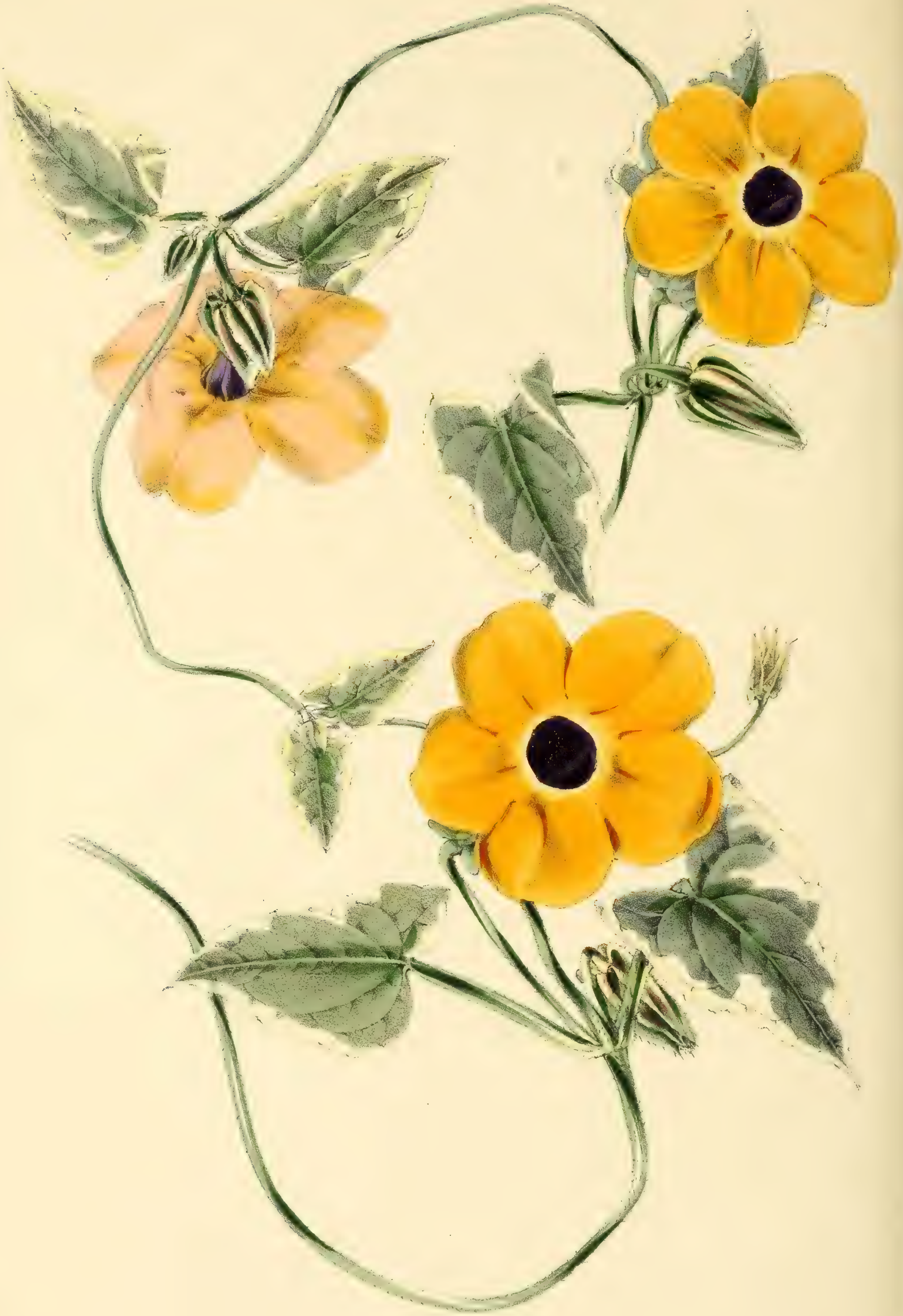
All the kinds are tender plants, some requiring the warmth of the stove, others the shelter of the greenhouse. The prevailing colours of the flowers are white and yellow, with tinges of red in various shades and degrees; the *C. bicolor* alone exhibits the deep rich colouring, as shown in the figure.

The leaves and wood of all the species, but especially of the subject of our plate, afford, when either bruised or chewed, a very rich yellow colouring matter, which, with a proper mordant, would no doubt form a good dye.

The cultivation is not attended with difficulty; the plants merely require to be potted in a mixture of equal parts of sandy loam and peat, with a little silver sand; giving good drainage, and plenty of root room.

Cuttings strike root freely if planted in pots of sand, and placed under a glass in heat.

The name is derived from *Cantu*, the Peruvian name of one of the species.



S. Holden del. & Lith.

Thunbergia Doddsii?

THUNBÉRGIA AURANTÌACA DODDSII.

(Variegated Orange-flowered Thunbergia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
ACANTHÀCEÆ.
(Acanthads, *Veg. King.*)

Generic Character.—*Calyx* double, outer one consisting of two heart-shaped leaflets, each having three nerves, inner one smaller and toothed. *Corolla* consisting of one petal, somewhat bell-shaped, with a limb divided into five equal lobes.

Specific Character.—*Plant* herbaceous, hairy. *Stems* numerous, twining. *Leaves* partially hastate, acuminate, hairy, with winged petioles, which frequently have irregularly indented margins. *Calyx* with two large, persistent, exterior envelopes, pale green. *Corolla* monopetalous; limb five-parted, divisions nearly equal, rounded, bright orange; throat hairy in the inside, very dark purple. *Stamens* inserted in the tube of the corolla, scarcely half so long, beautifully bearded. *Style* nearly twice the length of the stamens. *Stigma* concave, with a protuberant horn. *Capsule* almost globular, but having a conspicuous beak arising from its centre.

Doddsii.—Leaves edged with white.

Authorities and Synonymes.—Thunbergia, *Linn.*; Flemingia, *Hamilton*; Diplocalymna, *Spreng.*; Thunbergia aurantiaca, *Lindl.*; Thunbergia Doddsii of the nurseries.

This very beautiful variegated variety was raised in 1847, by Mr. Dodds, gardener to Colonel Barker, of Salisbury, from seeds of *T. aurantiaca superba*; and with exception of the variegated leaves, it agrees in every respect with the parent, both in the size of the flowers and in the richness of their colour. The most expressive name would have been *Thunbergia aurantiaca variegata*, but as the plant has become known in nurseries by the name of *T. Doddsii*, and we are unwilling to deprive a persevering man of any portion of the honour he has acquired, we willingly adopt the popular appellation.

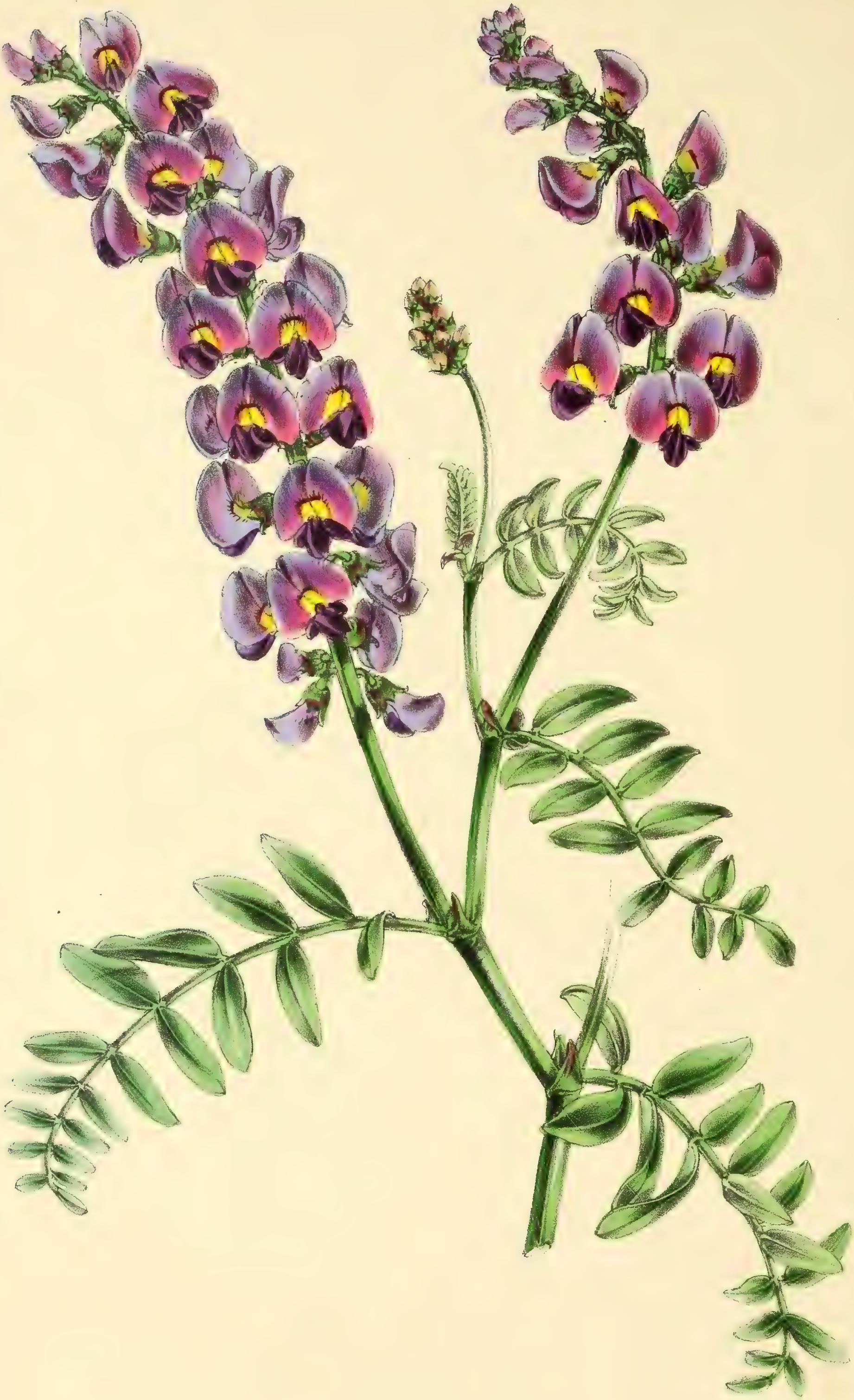
Thunbergias, in addition to their beauty, are of great value as winter flowerers, if grown where they can receive a moderate supply of moist heat; they are very easily managed, and will grow freely either in a stove, an intermediate house, a greenhouse, and even during the warm months of summer, in the open air. In whatever situation they are grown, the foliage requires to be subjected to a considerable portion of moisture; in the stove and intermediate houses let the atmosphere be very humid, and the plants often syringed overhead; and it is also advisable not to allow them to be very much exposed to the direct rays of the sun, otherwise they usually become much infested with the Red Spider.

The best soil is a mixture of equal parts of sandy loam and heath mould, with a little broken charcoal, or even ashes of burnt wood, and a portion of silver sand.

Propagation is effected by cuttings of the half-ripened wood planted in sand under a glass, and placed in a brisk moist heat.

Our drawing was made in September, from a specimen furnished by Mr. Dodds, the raiser of the plant.

The generic name is given in honour of C. P. Thunberg, a celebrated Swedish botanist and traveller.



S. Holden. del & Lith.

Swainsonia coronillæfolia.

SWAINSÒNIA CORONÍLLÆFOLIA.

(Coronilla-leaved Swainsonia).

Class.
DIADELPHIA.

Order.
DECANDRIA.

Natural Order.
FABÀCEÆ.
(Leguminous plants, *Veg. King.*)

GENERIC CHARACTER.—*Calyx,* bicallous at the base, five-toothed. *Vexillum* flat, large. *Stamens* diadelphous. *Carina* obtuse, rather longer than the wings. *Stigma* terminal. *Style* bearded longitudinally behind, but beardless in front. *Legume* turgid. *Don's Syst.*

SPECIFIC CHARACTER.—*Plant* a smooth shrub, growing three feet or more high. *Branches* erect. *Leaves* consisting of nine to eleven pairs of oblong, smooth, emarginate, glaucous leaflets. *Racemes* axillary, many-flowered, much longer than the leaves. *Calyx* of a pale green; teeth acute. *Vexillum* large, flat, of a violet-crimson, with a greenish yellow eye. *Carina* of a rather deeper purple than the vexillum.

AUTHORITIES AND SYNONYMES.—Swainsonia, *Salisb. Par.*, No. 28; *R. Brown,* in *Hort. Kew.*, Ed. 2, v. 4, p. 326; *De Candolle's Prod.* 2, p. 272. Swainsonia coronillæfolia, *Salisb. Par.*, No. 28.

A VERY elegant greenhouse plant, not uncommon in collections, but much less grown than its merits deserve. The general habit resembles that of *Sutherlandia frutescens*; but it is superior to that plant both in its growth and flowers.

It is a native of New South Wales, and was introduced to this country by Sir Joseph Banks so long ago as 1802: its distribution has been pretty general, and its beauty invariably acknowledged. Yet it has failed to attract that attention from cultivators which some other plants with far less charms have insured; and our present notice is given with a view of encouraging its more extensive cultivation.

It should have the temperature of a cool, airy greenhouse, where it can receive abundance of light during the winter; in summer it may be turned out into the open air, either remaining in a pot, or being planted out in the borders.

The proper soil is a light sandy loam mixed with one-third of turfy peat, and a small portion of well-rotted leaf-mould. A good drainage is also of importance.

The flowers are produced almost uninterruptedly for nine months in the year, and the plant always derives benefit when the blooming season is over, by all the stems being cut down to six or eight eyes.

Propagation is easily effected by cuttings of the half-ripened wood, planted either in sand or very light soil, and the pots plunged in a little moist bottom-heat.

Our drawing was made in April 1843, from a fine plant which bloomed in the gardens at Chatsworth, and specimens were also furnished to us at the same time, by Mr. Skirving, Nurseryman, Liverpool.

The generic name was given in honour of Isaac Swainson, a great cultivator of plants about the end of the last century.

CULTURAL CHEMISTRY.

(*Continued from page* 204.)

In the preceding number, an attempt was made to expose the mistake of that modern theory, which assumes that the leaves of plants absorb the gases that float in the air, and thus become the channels through which the organic substances that form their nutriment, are introduced into their tissues. Woody matter constitutes the bulk and strength of trees and shrubs; and it is reasonable to suppose, that the ligneous principle is derived from carbonic acid. Wood is the origin of charcoal (carbon), so far as the works of man are concerned: whether—if reference be made to first causes—the order should be reversed, or not, does not belong to the present inquiry. For that, it need only be stated that there are two direct gaseous compounds of carbon with oxygen:—First, carbon the base, with one equivalent of oxygen, which combination produces carbonic oxide, a gas that abounds in all furnaces, where combustion proceeds slowly and at low temperatures, causing much waste and loss of fuel in all our forcing-houses. Second, carbon as the base, with two equivalents of oxygen, constituting carbonic acid—the product of perfect combustion—a gas destructive of animal life, but congenial to vegetable nature, if applied in those due proportions which nature ever supplies, when man performs his part by the introduction of decomposable manures into the body of the soil. Carbonic acid is always generated in large quantity, when organic matter undergoes fermentive decomposition; and its constant presence in the atmosphere, has induced the belief to which we have above referred. The other organic elements of organic structure are oxygen, the vitalising principle of atmospheric air; nitrogen or azote, the qualifying or diluting principle (if the terms be allowed) of the air, by which, in all climates and in all situations, it is fitted to support the functions of breathing-life; and hydrogen, the lightest of all gases, and the grand base of pure water. Three volumes of hydrogen gas and one volume of azote, condensed in bulk to two volumes, that is to one half, constitute ammoniacal gas, which is also, to a very limited extent, present in atmospheric air; but this gas, and likewise carbonic acid gas, being very easily soluble in water, are brought down to the earth by mists, fogs, and every falling shower. With these facts, before the dismissal of farther inquiries connected with the organic constituents of vegetable structure, it will be just to the modern theory to state, that, among the many experiments which are inadmissible, there are others that appear to have been performed upon principles so correct to nature, as to have given fair sanction to the theory, that plants absorb gaseous elements through the porous system of their leaves. One of these has thus been cited in the French periodical "Illustration, Journal Universel," of September 30th:—"About five years since, an English agricultural teacher (*agronome*) put 100 kilogrammes (say 220 lbs.) of earth, previously dried in an oven, into an earthen vessel. The earth was moistened with rain-water, and in it he planted a willow, which then weighed 2½ kilogrammes (the kilogramme is equal to 2.205 pounds avoirdupois). During five years the earth was carefully watered with rain or pure water (?). In order to prevent the access of any other mould, as dust or otherwise, the surface was covered with a flat metal plate, pierced with a great number of small holes, so as to permit nothing to pass but the atmospheric air only. At the end of the five years the tree was taken up, and its weight ascertained to be about 85 kilogrammes, amounting to some decimal parts above 187 avoirdupois pounds! The earth redried in an oven and weighed, was found to have lost 60 grammes only, or something under 930 grains. Thus," it is observed, "nearly 80 kilogrammes of woody fibres of bark and of roots were found to have been produced! In giving this recent experiment, which we borrow from an English journal, and which had already been performed more than two centuries before by Van Helmont, one of the great chemists of the day, we recall to recollection that within a few years past our own learned chemists, and the German Liebig, have published many others of a similar character, and which, to say the least of them, are equally interesting." (See "Illustration," Sept. 30.)

There is much plausibility in the inference at which modern theory arrives; we go farther, and admit that experiments so arranged tend very forcibly to confer weight on the hypothesis that plants do, in fact, absorb gaseous carbonic acid, which exists in the air. Still, however, it must not be overlooked that rain-water contains that gas, as well as a trace of ammonia, and some pure carbon, as is evidenced by the stain which rain-drops leave upon glass. Moreover, air is not excluded; it passed through the perforations of the metallic covering, and air abounds with gaseous admixtures. Hence, every application of water would convey nutritive solutions to the soil. But it is not our object to impugn the doctrine of absorption *in toto.* Leaves *have* vascular pores, and some possess them on both surfaces—the microscope assures us of the fact—and skilful dissection has demonstrated their connexion with the internal tissues. The air, we perceive, abounds with gases independent of its two chief constituents, and immense volumes of aqueous vapour, carbonic acid, ammoniacal and hydrocarbonous gases, are daily and hourly poured into its volume from the surface of the earth; therefore we would incline to the belief that plants may attract such aerial matters as are congenial to their organisation, thus purifying the air by the removal of deleterious vapours. But belief is not assurance, and when we perceive that philosophers adopt a mode and apparatus of experiment at variance with the natural functions, we must hesitate still more.

If, however, we are not sure that leaves inhale, we are perfectly certain that they transpire, by their under surfaces at the least, if not by both. On this function (of which every observant gardener possesses positive evidence) Mr. Johnston offers the following pertinent remark in his Lecture:—

"From the pores of the leaves, odoriferous and other vapours, as well as liquids exude. Need I remind you of the odour of a turnip-field when the bulbs have begun to form? This and similar odours are due to the escape of volatile vapours from the leaves, which we have not yet sought to arrest or examine. The liquids which exude from leaves are no doubt various as their odours, their differences depending mainly upon the nature and the age of the plant. But there is reason to believe that they rarely consist of pure water. They hold in solution appreciable quantities of organic and saline matters, which, as the water evaporates from the leaf, remain behind upon its suface, or in its pores. These the rain washes off, and carries back to the soil; and this is one of the destined functions of the rain in refreshing the growing plant." These are startling, yet real facts, and claim the most refined experiments of analysis. Liebig, in his zeal for the Absorption Theory, stated that the manure, buried and laborated within the soil, became the source of an atmosphere of carbonic acid, which rising to, and above the surface, floated among the growing plants, by whose leaves the gas was sucked in, and by organic agency was decomposed in the cells and tissues, thus becoming the main source of nutriment and growth. It is wonderful to observe the working of the imagination, when it indulges in the speculations of a fanciful hypothesis. In this instance, the offices of the roots appear to have been lost sight of.

Coincident with this atmospheric theory was the opinion adopted by many of our modern lecturers, that plants obtain only mineral inorganic matter from the soil. Before we enter upon the analysis of this opinion, which, as Mr. Johnston told his audience at York, "had also received its death-blow," it will not be irrelevant to present to the reader the following tables of the component parts of sea-water, extracted from the Manuals of the two celebrated chemists, Dr. George Fownes and Professor Brande: it will be seen that great discrepancies exist, but these will not militate against the object which we contemplate.

1st. Dr. Fownes, p. 109—quoting the analysis of Dr. Schweitzer, of Brighton, the water being that of the Channel—gives 1000 grains as containing:—

	Grains.
Chloride of Sodium (Common Salt)	27·059
Chloride of Potassium (Muriate of Potash)	·766
Chloride of Magnesium (Muriate of Magnesia)	3·666
Bromide of Magnesium	·029
Sulphate of Magnesia (Epsom Salts)	2·296
Sulphate of Lime (Gypsum)	1·406
Carbonate of Lime (Chalk)	·033
Iodine and Ammoniacal Salt (Traces)	
Water (that is, in a state of purity)	964·745
	1000·000

"Its specific gravity was found to be 1·0274 at 60°. Sea-water is liable to variations of density and composition, by the influence of local causes, such as the proximity of large rivers, or masses of melting ice, and by other circumstances," one of which may be most important, namely, the flow of those vast subterraneous salt rivers which somewhere discharge their brine into the basin of the ocean.

Brande says, by evaporating a pint of sea-water, we obtain—

	Grains.
Common Salt	180·5
Chloride of Magnesium	23·0
Sulphate of Magnesia	15·5
Sulphate of Lime	7·1
	226·1

And this water, according to Murray, contains previous to evaporation—

	Grains.
Common Salt	180·5
Muriate of Magnesia	18·3
Muriate of Lime	5·7
Sulphate of Magnesia	21·6
	226.1

Traces of chloride of potassium, of iodine, and bromine, may also be found in it; and, according to Dr. Marcet, "of triple sulphate of magnesia, and potassa, and of muriate of lime."

Here then, to adopt chemical language, we obtain, as bases, soda, potassa, magnesia, lime, and perhaps ammonia; and as combining acids or neutralising elements, chlorine, hydrochloric (*muriatic*) acid, sulphuric acid, carbonic acid, bromine and iodine. Attention to these constituents is of the utmost moment, as is the great fact—one which every geological discovery tends to prove—that the whole surface of the globe was originally submerged in water, and consequently that all the saline matters which the earth contains, in whatever situation they exist, whether in rocks or earths, had their origin in the water of the sea.

Guano, as imported pure, is the type of all our modern empyrical compounds; it is the product of birds which feed upon fish, and deposit their ordure upon sea-rocks. Reasoning upon the composition of this remarkable and most comprehensive substance, and very probably upon that of sea-water itself—"Chemical analysis" (to borrow Mr. Johnston's words) "explained the composition of Guano," and he "declared that it could be imitated at a reasonable rate, and published experimental recipes for compounding artificial mixtures to be tried against it. Immediately, half-instructed men—supposing the practical conclusion already arrived at, which more cautious men were only beginning to seek for—hurried into what appeared to them a sure and easy way of making money. Artificial guanos and prepared manures, qualified to do everything, appeared in the market," &c., &c.

Some of these we have known and tried, but as they belong chiefly to agriculture, it will not be pertinent to dwell long upon the subject. One of them was seriously offered to the attention of gardeners, and met with occasional approbation; it is called Potter's Guano, and contains salts which are found in many plants, and to a certain extent, in some loams. The best preparation of an artificial manure that came under personal observation, consisted chiefly of a very large proportion of fine bone-dust, which if pure, contains about half its weight of phosphate of lime, from

10 to 12 per cent. of carbonate of lime, and above 32 per cent. of animal matter, with a trace of soda-salts. With the bone-dust were combined about 20 per cent. of powdered chalk, half that quantity of pearl-ash, and as much or more common salt. The great defect of this compost—as indeed it is of the best Guanos—is the absence of organic, decomposable substances, such as desiccated night-soil (*cloacine* or *poudrette*). It must be evident that, when solutions are made of such manures, as is done by mixing an ounce or two of them with a gallon of rain or pond-water, and using only the clear liquid, gardeners will obtain only the soluble salts,—the phosphate and carbonate of lime remaining as deposited feculences. Some gardeners have said that great benefit has been derived from the use of such diluted solutions, particularly in pot-culture of the Scarlet Pelargoniums. We ourselves can assert that a very little powdered guano (10 to 20 grains) sprinkled over the surface soil, and immediately watered, has apparently increased verdure and growth; but it ought always to be borne in mind, that Salts of Soda (as Common Salt), of Potassa, and Ammonia, and also the presence of that compound mixture which we have shown to exist in sea-water, may suddenly become very destructive. An instance lately occurred, and was made public, wherein great mischief had occurred with a numerous collection of plants, by the use of what was believed to be well-water in its ordinary condition. Nor was the error detected, till more destruction had followed the application of the same water; when by chemical analysis, it was ascertained that saline matters had gradually found their way into the well through some underground channels, by inter-filtration of sea-water.

Space is not here given for the continuation of our subject, as connected with the earths and alkalies that constitute the bases of the chief mineral and inorganic salts which occur in Practical Horticulture.

CULTURE OF THE CARAMBOLA AND BLIMBING AS FRUIT-TREES.

THE Carambola is the *Averrhoa Carambola* of our botanical catalogues, and the Tamaratonga, Camoni, Camarunga, and Blimbing of the native Indians. It grows abundantly in the Indian Archipelago, Bengal, Ceylon, and all the warmer parts of Asia; it was introduced to this country in 1793, and is associated with the Natural Order Oxalidaceæ.

In its wild state it forms a tree fifteen or twenty feet high, with a slender *stem*, seldom exceeding eighteen inches in circumference. The *bark* is brown. *Leaves* alternate, pinnated, each consisting of four or five pairs of alternate leaflets, which are ovate-acuminate, entire, stalked, outer ones largest, and all of them irritable. *Flowers* in short racemes, lateral, scented, minute, of a bright rose-colour, springing from the naked stems and branches. *Calyx* smooth, of five sepals, red. *Corolla* small, consisting of five petals, in form campanulate; segments oblong-ovate, somewhat rounded; of a rich, rosy-purple, variegated with orange-yellow. *Stamens* ten, disposed in five pairs, one half of which are fertile; filaments curved. *Fruit* with five acute angles, varying in size from that of a hen's egg to a large orange; they become very handsome as they approach maturity, the colour becomes of the richest yellow, and the perfume on ripening, is both rich and exhilarating: the pulp, however, contains a very large portion of acid, on which account it is less esteemed as a table-fruit than many other fruits; by some persons, however, it is considered when dead ripe, delicious.

Although from its acidity this fruit is not much sought after by Europeans for their dessert, yet it is very much brought to table as a pickle in its half-grown state, and likewise as a preserve made from the ripe fruit, for both of which purposes it is stated to be first-rate. In Java it is used both when ripe and unripe, in tarts, as apples are with us, and the flavour is said to be excellent; a syrup, also, is made with the expressed juice, and a valuable conserve of the flowers. These two last preparations are highly valued as remedies in fevers and bilious disorders; both the roots, leaves, and fruit, are also prescribed for similar diseases, and are either eaten alone, or along with the leaves of the Betel Nut tree. The juice of the ripe fruit makes a good dye.

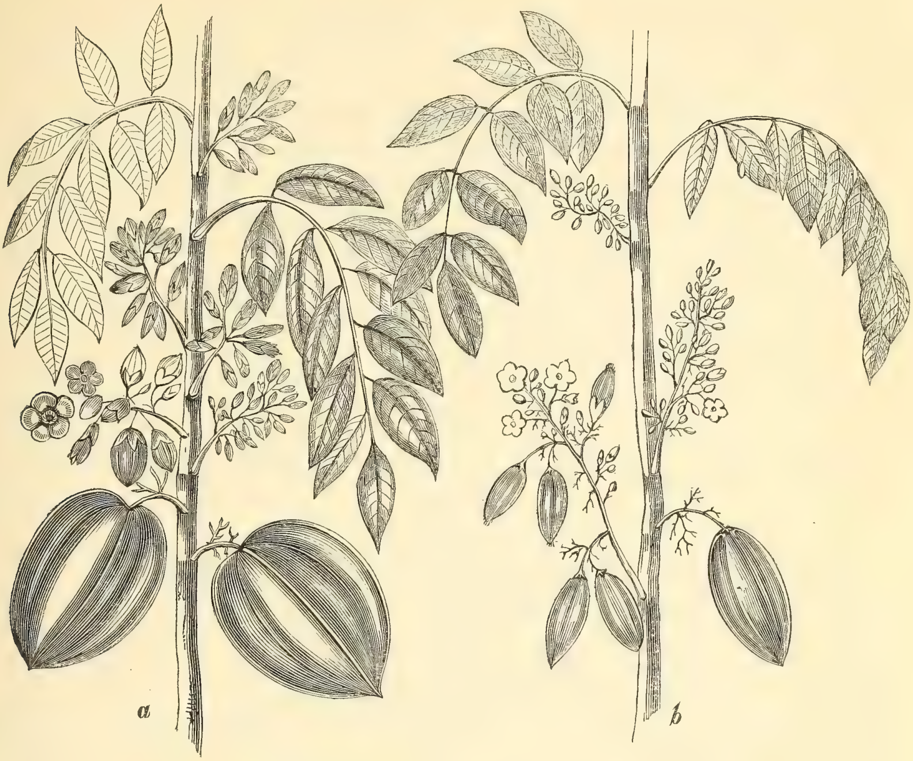
The appearance of the tree when covered with bloom and fruit, is very ornamental; although it is of a very moderate stature, yet it forms an elegant spreading head, and the light, hairy, pinnated foliage being not much unlike that of some species of Robinia, render the plant a favourite garden object; being in addition a very prolific fruit-bearer, producing three successive heavy crops in a year, and continuing to prosper under favourable circumstances from three until fifty years of age. The timber is little valued, and from its small size is seldom used.

Another species of Averrhoa, besides the Carambola, is much grown in India, and equally esteemed for domestic purposes with that fruit, namely—

THE BILIMBI (*Averrhoa Bilimbi*). This is the Cucumber tree of Goa, where it is extensively cultivated, as it is also in various other parts of the East Indies, and in South America. It forms a small tree, rarely exceeding in height eight to fifteen feet. The *branches* are few, and somewhat reclining. The *leaves* are alternate, pinnated, consisting of five to ten pairs of ovate-lanceolate, entire, smooth, sensitive leaflets on short petioles. *Flowers* disposed in racemes and panicles, produced from the trunk and branches. *Calyx* pubescent. *Petals* five, ovate-oblong. *Stamens* in five pairs. *Fruit* oblong, obtuse-angled, somewhat resembling a small thick cucumber, with a thin, smooth, green rind, filled with a grateful acid juice, the pulp and seeds being not much unlike those of the Cucumber.

The Bilimbi is used exactly in the same manner, and for the same purposes as the Carambola; the juice, however, although equally acid, is thought to be more grateful, and the fruit is neither so handsome or large, as the one previously described. The Bilimbi was introduced from India in 1791; and in its native country flowers from May to August.

The name Averrhoa is given in honour of Averrhöe of Cordova, a celebrated Arabian physician.



DESCRIPTION OF THE WOOD-CUT.

a Averrhoa Carambola. | *b* Averrhoa Bilimbi.

The cultivation of the above two species of Averrhoa is easy. If the plants are grown in pots or tubs, plenty of root-room should be afforded, and the soil should be composed of two parts good sandy loam, and one part very rotten manure; but if planted out in a prepared border, a light rich loam is all that would be required.

The temperature is that of a warm stove, where during the most vigorous growth they can be supplied with about 75° of heat with considerable humidity. In the dry season 70° with a moderate moisture; and in winter, from 50° to 55°, with a dry and airy situation.

Whilst the plants are in vigorous growth water with very weak liquid manure, and syringe with pure water over the foliage; but this must be discontinued when the fruit is ripening, and during the period of torpidity.

Give a liberal supply of air whenever the weather is fine, but be careful not to expose them to any direct cold draught.

Neither of the species require bottom heat; yet if grown in pots or tubs it is generally thought advantageous to plunge them, either in earth or old tan, for unless this be done, they are thought sometimes to fail in blooming so freely, and setting so good a crop of fruit.

The plants are of very rapid growth, and the leaves soon fall; the stem and branches soon become naked for a considerable distance. When the plants have been grown freely for three or four years, they will commence flowering. The season for this is July; and the bloom will continue to be produced in succession until October. The fruit swells off freely, and seems to meet with no check until it reaches maturity.

Propagation is effected by ripened cuttings, which strike root freely if planted in sand under a hand-glass in heat.

NOTICES OF A FEW HANDSOME HARDY HERBACEOUS PLANTS.

Species with Blue Flowers.

Aquilegia jucunda, *Joyous Columbine.*—A native of the mountains of Siberia. It grows about a foot high, and should be grown in sandy soil. It also thrives well on rock-work, because it is pretty dry in winter, but during the period of growth a liberal supply of moisture is requisite.

Campanula grandis, *Large Bell-flower.*—This species has all the beauty of the favourite *pyramidalis*, and is even more showy. It requires a warm situation, and light sandy soil. See "Mag. Bot." v. x., t. 31.

Gentiana septemfida, *Seven-cleft Gentian.*—This grows about a foot high, is a very abundant flowerer, the colour is very vivid, and the plant grows with great freedom in a dry border. See "Mag. Bot." v. viii., t. 51.

Pentstemon Gordoni, *Mr. Gordon's Pentstemon.*—It is very hardy, grows about a foot high, produces a profusion of delicate sky-blue flowers, and should be planted in a dry situation.

Pentstemon ovatum, *Ovate-leaved Pentstemon.*—This very pretty species continues to bloom during the whole summer. It is a native of North America, and usually grows about a foot or eighteen inches high, and should be grown on a dry border or rock-work. See "Mag. Bot.," v. xiii., t. 99.

Salvia azurea, *Azure-blue flowering Sage.*—It is a native of North America, and in favourable situations in our borders will attain the height of four or five feet, and bears a vast profusion of flowers. See "Mag. Bot." v. xii., t. 31.

Salvia bicolor, *Two-coloured Sage.*—A native of the North of India, but is perfectly hardy; it grows five feet or more in height, and when in flower is exceedingly handsome, the spike being nearly four feet long, and in the distance somewhat resembling the *Lupinus polyphyllus.* See "Bot. Mag.," v. ix., t. 272.

Species with Red and Scarlet Flowers.

Anemone Japonica, *Japan Anemone.*—A remarkably fine autumn-flowering species, either calculated for a conspicuous place in a warm, dry border, or for pot culture. The flowers are a fine crimson, and are produced in profusion. The plant when in full bloom, will attain the height of eighteen inches.

Antirrhinum majus caryophyllus, A. majus Youngianum, and A. majus flore-pleno, are three beautiful varieties of the *A. majus.* They grow about two feet high, and should be planted in sandy soil. The flowers are finely striped. "Mag. Bot.," v. v., t. 55 ; v. xiii., t. 272 ; and v. xi., t. 100.

Aquilegia Skinneri, *Mr Skinner's Columbine.*—A peculiarly handsome kind, requiring to be grown in light soil on a sunny border. It is said to be a native of Guatemala. The flowers are a rich orange-red and green, and are very showy. "Mag. Bot.," v. x., t. 200.

Dielytra spectabilis, *Remarkable Dielytra.*—For the particulars respecting this fine plant, see "Mag. Bot.," v. xv., t. 127.

Echinacea intermedia, *Intermediate Hedgehog-flower.*—The plant, when in flower, grows about two feet high, has a robust habit, is quite hardy, a free bloomer, very handsome, and will grow in almost any soil and situation. "Mag. Bot.," v. xv., t. 80.

Pentstemon gentianoides diaphanum, *Transparent Gentian-like Pentstemon.*—The flowers of this variety are somewhat larger than those of the species. It is of a paler colour, very handsome, flowers freely during the whole of the summer and autumn, and attains the height of three feet, growing freely in any light garden soil.

Pentstemon gentianoides splendens, *Splendid Gentian-like Pentstemon.*—This is truly a splendid variety, with rich carmine flowers, much larger than those of *P. gentianoides.* It is a native of Mexico, and may be grown in almost any situation, if the soil be light and sandy. "Mag. Bot.," v. ix., t. 176.

Pentstemon McEwani, *Mr. McEwan's Pentstemon.* A garden variety, very handsome, but paler in colour than *P. Gentianoides,* from which it was raised. "Mag. Bot.," v. xiv., t. 174.

Pentstemon miniatus, *Vermilion-flowered Pentstemon.*—A small slender-growing species, a native of Mexico, and grows freely in the borders, planted in light soil, where it attains about a foot in height.

Phlox Van Houttei, *Van Houtte's Lychnidea.*—This fine variegated-flowered kind is now pretty well distributed through the country. "Mag. Bot.," v. xi., t. 174.

Potentilla Hopwoodiana, *Mr. Hopwood's Cinquefoil.*—A very superior border flower, growing two feet or more high, and as much broad. It is a most profuse bloomer, and should be planted in a rich loamy soil. "Mag. Bot.," v. vi., t. 149.

Potentilla McNabiana, *Mr. McNab's Cinquefoil.*—Another brilliant-flowering variety, fully equal, if not superior to the last; it grows to the height of two feet six inches. It will grow in any soil and situation. "Mag. Bot.," v. xiii., t. 219.

Zauchneria californica.—For the figure and particulars of this fine new hardy plant, see "Mag. Bot.," v. xv., t. 195.

Species with Yellow Flowers.

Batschia canescens, *Canescent Puccoon.*—This is the *Lithospermum canescens* of the "Botanical Magazine," and is a very pretty orange-flowered plant. "Mag. Bot.," v. xv., t. 152.

Iris aurea, *Golden Iris.*—"A free-flowerer, with the habit of *Iris ochroleuca*, and grows as tall." * It requires only the most ordinary treatment of hardy perennials.

Pæonia Wittmanniana, *The Yellow Pæony.*—Although this plant has been in the country some years, it is yet almost unknown. It requires only the most common treatment.

Pascalia glauca, *Glaucous-leaved Pascalia.*—A fine plant, growing four feet or more high, and producing large yellow flowers. It will thrive in almost any kind of soil and situation. "Mag. Bot.," v. viii., t. 125.

Species with Rose-coloured Flowers.

Amphicome arguta, *Finely-cut-leaved Amphicome.*—A truly elegant plant from the Himalayan Mountains. It should be planted in a light soil, and have a warm situation. "Mag. Bot.," v. vi., t. 79.

Chelone Lyonii, *Mr. Lyon's Chelone.*—This fine kind is a most useful plant: it may be grown in almost all situations that are moderately dry, flowering equally as strongly and freely in a border where the sun's rays can never reach it, as in one with all the opposite advantages. It also continues in bloom for a great length of time, and usually attains to the height of two feet.

Morina longifolia, *Long-leaved Morina.*—A very handsome herbaceous plant, a native of India. It grows about two feet high, and will thrive in any situation provided the soil is light.

Species with Purple Flowers.

Campanula nobilis, *Noble Bell-flower.*—A species very nearly related to the Canterbury Bell, but differs in the colour of the flowers, which is a lilac purple. It forms a plant, when in bloom, about eighteen inches high, and flowers very freely.

Chelone obliqua, *Oblique-leaved Chelone.*—An old but very fine species of *Chelone*, bearing dense spikes of reddish-purple flowers; it grows about two feet high, and grows in any light soil. "Mag. Bot.," v. vii., t. 150.

Digitalis purpurea superba, *Superb Purple Fox-glove.*—Handsome as is the common Foxglove of our woods, this variety is very superior. Its flowers are produced in great profusion, and endure a long time. It requires only the most common treatment of hardy perennials. "Mag. Bot.," v. x., t. 30.

---

* "Bot. Reg.," xxxiii., t. 59.

PHLOX COLDRYANA, *Mr. Coldry's Phlox.*—The flowers of this garden hybrid are of a deep crimson-purple, and very showy. The plant grows two feet or more high, and should be planted in a rich loamy soil. "Mag. Bot.," v. vii., t. 197.

THE SWEET CALAMUS, OR CALAMUS AROMATICUS OF THE ANCIENTS.

CALAMUS is a name given by Linnæus to a genus of plants, commonly known as reed-palms, on account of their resemblance in habit to many of the arborescent grasses. They grow very lofty, but are so exceedingly slender, that an ordinary observer would be more likely to consider them tall reeds, rather than members of so noble a family as the Palms. The inflorescence, however, is that of a true Palm.

Amongst the more remarkable species of this genus, may be mentioned the Cable Palm or Cable Cane (*Calamus rudentum*), which has been known to grow to the extraordinary length of 500 feet, and even its most common growth is from 300 to 400 feet. The smallest stems are twisted into ropes and cables; and others when split, are wove into baskets, whilst some are made into hoops for casks, and used for various other similar purposes. The stronger ones are chiefly manufactured into walking-sticks, and made into slender supports for furniture. In the Molucca Islands, Cochin-China, and various parts of the East Indies, this species grows in abundance.

THE ZALACCA REED, (*Calamus Zalacca*, or *Zalacca edulis.*)—This species bears a very pleasant eating nut, and on that account is much cultivated in Java and the neighbouring islands. The fruit is about the size of one of our small walnuts, and the kernels are said to be very sweet and good.

THE RATTAN CANE, (*Calamus rotang*, and *Calamus Scipionum*).—The slender stems of these two species of Palm have been long brought to this country under the above name, and have been prized for walking-sticks and various other domestic purposes.

THE DRAGON'S BLOOD PALMS, (*Calamus Draco*, and *Calamus Zalacca*).—Both yield the well-known drug called Dragon's Blood, which is their inspissated juice.

Although all the above species of Calamus possess properties of considerable importance to mankind, and must therefore be included amongst the more valuable of Nature's productions; yet it is evident that none of the above can be considered the plant which was known to the ancients by the name of *Calamus*, as all are quite destitute of fragrance, whereas the *κάλαμος* (*calamos*) of Dioscorides possessed so fine a perfume, as to be classed amongst the chief spices and odoriferous productions of that day, and was also one of the ingredients in the formation of the fragrant oil used by the Jews in their tabernacle and temple worship. See Exodus, c. xxx., v. 23. On account of this odoriferous property, rendering it a valuable article of commerce amongst the ancients, we must in some measure depend for our knowledge of the true plant upon their writings, and the observations and discoveries made by more modern and recent writers and travellers, especially such as have collected information respecting the productions and commerce of the East.

In marshes, and other watery places, there grows in almost every county in Great Britain, and also in many parts of the continent, a perennial *flag*. It has horizontal, fibrous, and crooked *roots*, which are usually about an inch in thickness. and possesses a very pleasant fragrance. The *leaves* are long, and sword-shaped, sheathing into each other. The *flowers* are small and inconspicuous, but are produced on a spadix, and form a green spike, issuing from the edge of the leaf. This plant is the Sweet Flag, or Calamus; the *Acorus Calamus* of our shops and botanical catalogues. It possesses an aromatic-bitter principle, and has been thought to be of some use in medicine; but at present nearly the only use that is made of it, is in the manufacture of hair-powder, to which it gives an agreeable perfume. In Constantinople, either this or a nearly allied species, is made into a confection, and esteemed a good stomachic. Formerly considerable quantities of either this root, or that of some other species resembling it, were annually imported to this country under the name of *Calamus Aromaticus;* this led many persons to believe that this was really the plant so highly prized by the ancients, and, indeed, much might be advanced in favour of such a supposition, especially if we take into consideration the wide range of climate over which this plant is found to grow, being even according to report, abundant in continental India.

If, however, we examine carefully the writings of the ancients, there appear sufficient reasons for rejecting this *flag*, and substituting another and a different plant, having the growth and appearance of a reed or cane. Thus Theophrastus, in speaking on this subject, and informing us of its locality, mentions that, in a little valley called *Aulon*, at the foot of Mount Libanus, there grows the κάλαμος, or Sweet Reed, and σχοινος (*schœnos*), or Sweet Rush; he also states that no fragrance is emitted whilst it is growing, but when partially dried, the smell is apparent at some distance.

Strabo also informs us, that the κάλαμος (*calamos*) grows in the country of Sabæi, and in speaking of Syria, and its mountains *Libanus* and *Antilibanus*, he mentions that in the valley betwixt them there is a lake, which produces both the Aromatic Rush, σχοινος (*schœnos*), and the Sweet Reed, κάλαμος (*calamos*), and that the Balsam (*Balsamodendron Gileadense*) also grows abundantly in the same place.

Polybius, who lived 150 years after Theophrastus, mentions the same valley betwixt Libanus and Antilibanus, and calls it Marsyas; stating, that in the wet marshy ground about the lake, both the aromatic reeds, κάλαμος, and sweet rushes, grow in abundance.

Pliny also in his writings says:—"Within Arabia there groweth the Sweet Calamus, which is common both to this country and to the Syrians likewise, but that of Syria passeth all the rest, and cometh up in a valley between Mount Lebanon and another mountain: there groweth both the Sweet Calamus and the *Juncus odoratus*."

From Dioscorides we learn that its virtues and localities were well known to both the Greeks and Arabians.

Clusius, whilst making his researches amongst the medical plants of the East, understood from the merchants who traded in this article that it grew naturally in the valley betwixt Libanus and Antilibanus; but he was not able to ascertain that to be the fact; the Sweet Rush (*Schœnus*), called Camel's Hay, was found to abound in that locality, but nothing that answered the description of the Calamus; and from other sources he afterwards learned that the greater part if not the whole of that perfume was brought by merchants from India.

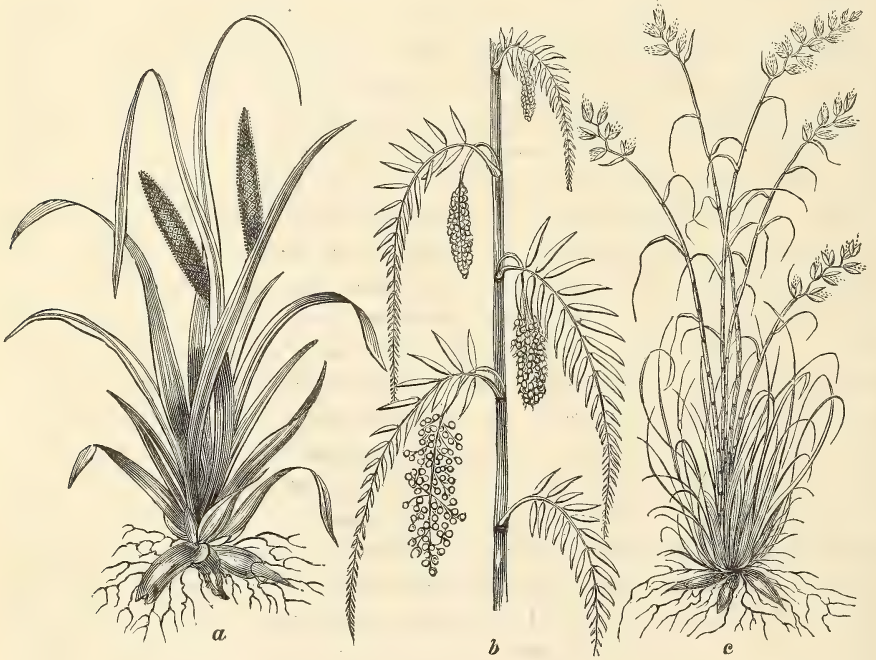
From the above remarks we are led to the supposition that the *κάλαμος* (*calamos*) of the ancients was a kind of fragrant reed or cane, and was probably identical with the Sweet Cane of Jeremiah, c. vi., v. 20; and Isaiah, c. v.; although the word in Jeremiah, as mentioned in the Septuagint, is *κιναμωμον* (*cinnamon*), and by Isaiah as *θυσιαμα*, "a perfume." In Ezekiel, c. xxvii., v. 19; and c. xxx., v. 23, however, *κάλαμος* (*calamos*) is mentioned in connexion with Cassia, and other articles purchaseable in the markets of Tyre; and in the Canticles, c. iv., v. 14, Calamus is spoken of as growing in a superb garden, watered by streams from Lebanon, along with Cinnamon, Spikenard, Saffron, Myrrh, Aloes, Frankincense, and other chief species.

As the Calamus was cultivated in a choice garden, along with plants from the East Indies, and other distant countries, it would appear probable that, like them, it was of foreign introduction, or if indigenous it was so scarce, like some of our native plants, as to be little known. Tradition reports it to have been one of the gifts presented to Solomon by the Queen of Sheba, or Saba; if so, its introduction into Syria would be more than 900 years before the Christian era, and it is not difficult to understand how it might afterwards have become naturalised in the localities where it was observed by Dioscorides, Theophrastus, and other writers of a less ancient date. The quantity, however, found naturally in Syria in their days must have been very insufficient to supply the vast demand which an article of so much repute would insure; and the quality, also, might be very inferior to that of the foreign article; hence it is probable that large importations, perhaps from India, were made through the merchants who traded in spices and other equally valuable commodities. Indeed India is rich in aromatic reeds and grasses, and amongst these we might mention a few of the most prominent; and first, the KHUS, or KOOSA GRASS (*Anatherum muricatum*); the fragrant roots of which are placed amongst clothes to scent them and keep away insects, in the same manner as we use Lavender flowers. They are also wove into loose mats or screens, which, when hung before doors and windows, and sprinkled with water, temper the violence of the heat, and at the same time fill the apartments where they are used, with a very agreeable perfume. The GINGER GRASS, or KOSHEE (*Anatherum nardus*), is another of these fragrant reeds; it has even by some been thought to be the Nard, or Spikenard of the ancients, which, however, is most likely the *Nardostachys Jatamense.*

The ATAXIA HORSFIELDII and HIEROCHLOE BOREALIS also emit a rich perfume after they are cut and perfectly dried, although it is not so much perceived when they are in vigorous growth. But none of these are equal to two species of Andropogon, one of which is most likely the true Calamus of Dioscorides, and the "Sweet Cane" and "rich aromatic reed from the far country" of Scripture. The first of these we shall notice is—

The Lemon Grass (*Andropogon*), Cymbopogon Schœnanthus.—This slender reed was introduced to our gardens in 1786, but being a stove plant with no ornamental flower, it has been long exploded from our collections. The stems were formerly supplied to the shops of this country from Turkey; being packed in bundles about a foot in length, and were supposed to possess aromatic and stimulant properties; but their use has been long discontinued.

The Supposed true Calamus Aromaticus, (*Andropogon Calamus Aromaticus*) is a taller and more ornamental growing species than the Lemon Grass; it has been supposed, both by Sir Gilbert Blane and his brother, to be the true Nard, or Spikenard, of Scripture; but Dr. Royle and others, with good reason, believe it to be the real Calamus of the ancients; its growth is reed-like, with somewhat of the consistence of a cane; its fragrance is exhilarating and delightful; and the essential



DESCRIPTION OF THE WOOD CUT.

a Acorus Calamus, or Sweet Flag, the British Sweet Calamus.
b Calamus Rudentum, or Cane Calamus.
c Andropogon Calamus Aromaticus, or true Calamus of the Ancients.

oil obtained from it is so aromatic, that it would be in every respect of sufficient importance, to form an ingredient in the expensive preparation, used by the Jews in their tabernacle and temple worship.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED AND DESCRIBED IN THE "BOTANICAL MAGAZINE" AND OTHER LEADING PERIODICALS FOR OCTOBER.

Achimenes longiflora macrantha. This variety we noticed in Messrs. Lane's collection at Berkhampstead, the flower being considerably larger, of more substance, a better blue, and has a yellow eye. The habit is the same as *A. longiflora*. Along with the above we noticed another species, called—

A. candida. One of the smaller kinds, bearing a profusion of white blossoms, having a yellow mark down the lower petal.

Anemone hybrida. A fine variety raised from seed, by Mr. Gordon, in the Gardens of the Horticultural Society, produced by crossing *A. japonica* with *A. vitifolia*. The advantage gained is the finer and broader petals than *A. japonica*, on the one part, and having a delicate rosy tinge in the flower, which its other parent does not possess, being quite white. The habit is between the two, and it flowers a month earlier than *A. Japonica*, is quite hardy, and a desirable plant for ornamenting the flower-garden.

Chaetogastra strigosa. A melastomaceous plant of considerable merit, we found flowering luxuriantly in the nursery of Messrs. Veitch & Son, Exeter. It has small but very deep rose-coloured flowers, produced in clusters at the axils of the leaves, the latter being small. The plant appears to keep close to the ground ; useful among rockwork : it is very pretty, and will form an acquisition to our gardens.

Dichorizandra ovata. In the above-named nursery we noticed a fine specimen in bloom of this species, with three or four spikes of those intense blue flowers, which render this plant so remarkable. We likewise noticed it in flower in the stove of Messrs. Knight and Perry, Chelsea.

Epiphyllum coccineum grandiflorum. Recently we noticed in the gardens of Lady Antrobus, Cheam, a splendid flower, both for size and colour, being upwards of eight inches in diameter, and a rich scarlet with the purplish tinge at the base of the petals. The variety was raised by Mr. Green (her ladyship's gardener), from seed, produced by crossing *E. speciosissimum* and *Ackermanni*, certainly the finest variety in cultivation. The habit of the plant is an union of both parents but like neither of them.

Gloxinia, *hybrid var.* We found flowering in Messrs. Henderson's Nursery, Pine-apple Place, Edgware Road, a remarkably fine variety both for size and purity of colour. It is white, with a dash of brilliant crimson down the throat and lower limb of the flower, is of good substance, well formed, and free from any undulations. The habit is that of *G. cerina*.

Hypocalymma robusta. A shrub of very prepossessing appearance we noticed in the greenhouse of G. Lorraine, Esq., Carshalton. It has much the appearance of a *Spiræa*, with clusters of rosy lilac flowers produced at the axils of the leaves, completely clothing the stem. The foliage neat ; most probably will become a very useful plant.

Impatiens repens. This very distinct Balsam has flowered in the nursery of Mr. Jackson, Kingston ; bears bright yellow flowers, which no doubt will be produced pretty freely when its cultivation becomes better known. The habit is pendent, with small heart-shaped foliage. It was introduced by Mr. H. Low, of Clapton, from Ceylon.

Ixora odoratissima. Messrs. Rollisson, Tooting, have recently flowered this species, its greatest merit being a most delicious perfume. The head of bloom is large, but loose and straggling, from the flowers being long and thin in the tube, so slight as scarcely able to sustain the weight of its minute flower. The prevailing colour is yellow, shading to the throat, which is white. The foliage is large and handsome ; some of the leaves measured fourteen inches long by four inches in breadth, and are of the richest green.

Ixora, sp. nov. We observed a very pretty species of this race in the stove of Messrs. Veitch and Son, Exeter, flowering abundantly with large compact heads of scarlet and maize-coloured flowers. The habit is neat, and the plant is altogether very attractive.

Lobelia, *hybrid var.* In the nursery of Messrs. Knight and Perry, Chelsea, we saw a new Lobelia of great beauty, very dwarf, not more than than six or eight inches high, more than half of which was composed of a cylindrical spike of intense blue flowers, the spike being about two inches in diameter. The foliage is a bright and lively green, contrasting admirably with the rich colour of the flower.

Miltonia, sp. nov. A remarkable species or variety of *M. spectabilis* has flowered in Messss. Loddiges' collection at Hackney. In form it is exactly that of the dark variety of *M. spectabilis,* the difference chiefly consisting in the sepals and petals being a dark purple or plum colour, instead of the pale straw colour of the species generally cultivated. The foliage is a much better green, and somewhat stronger growing than the old variety. In collections where the one is, the other variety ought to be, as the richer coloured flower will certainly assist in rendering a fine specimen more gay by being grown with it.

Potentilla Menziesii. One of the many changes by hybridising this showy genus, has lately flowered in the nursery of Messrs. Knight and Perry, Chelsea. The flowers are larger, colour deeper and richer than any variety we know ; like all the race, it blooms freely in sunny weather.

Passiflora Nieumannii. A very pretty flower with bright blue rays on the greenish white ground of the petals, very neat habit, and will most probably prove hardy. It is a hybrid variety, and well worthy cultivation. It flowered recently in the above-named nursery.

OPERATIONS FOR NOVEMBER.

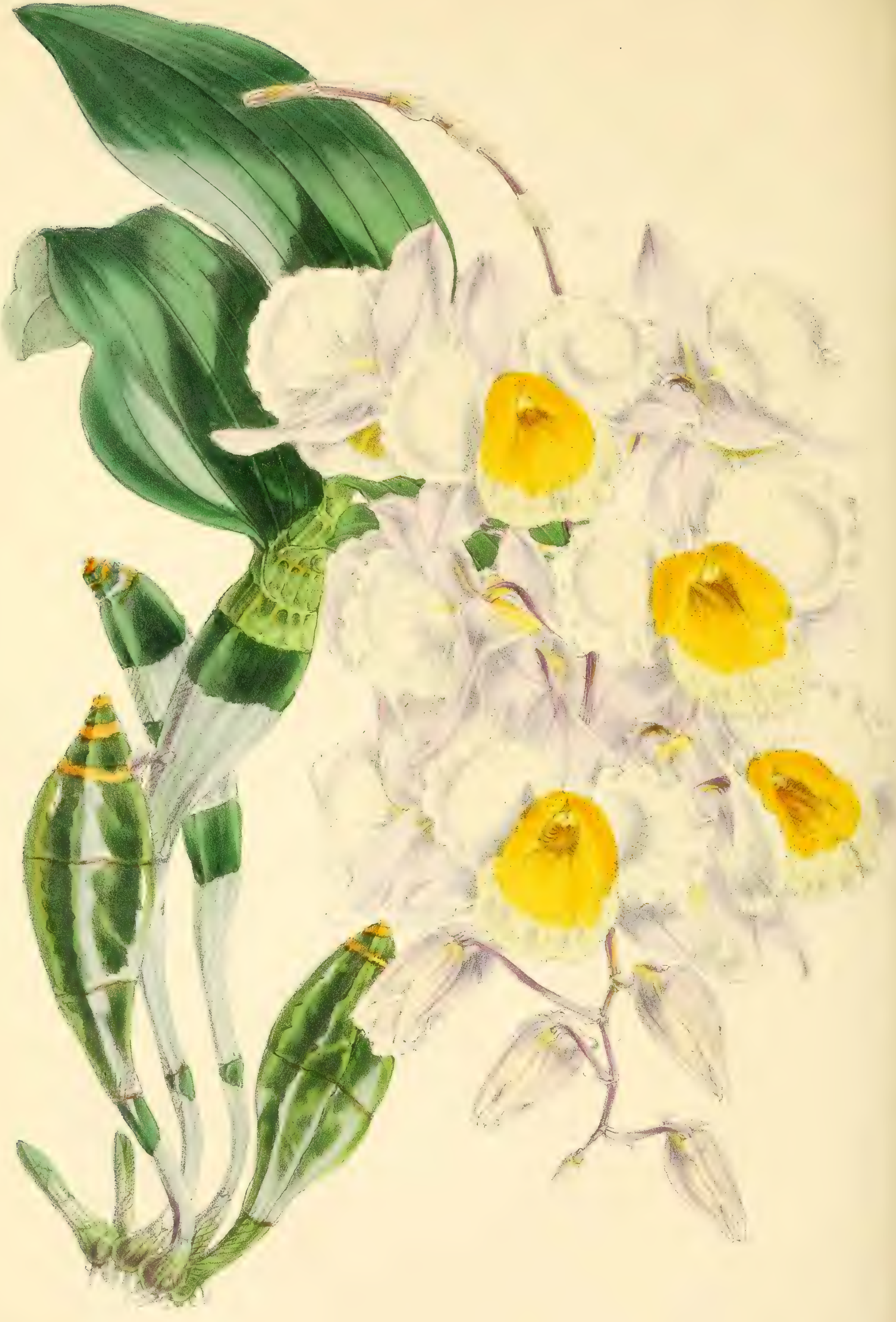
The past month has been very wet ; but if the weather should be sufficiently open and favourable, now is the time to proceed with all expedition with intended alterations and improvements ; also planting deciduous and evergreen trees and shrubs, draining wet grounds, making new or altering old borders and flower-beds, collecting soils, mulching and fastening newly-planted trees, and especially such as are tender at the roots, taking up and stowing away Dahlias, finishing the planting of bulbs, cutting off the dead and dying tops of herbaceous plants, trimming and cleaning others, raking beds and borders, protecting with mats or other covering plants which are not very hardy, placing sawdust over the roots of plants which die down, destroying mice, which eat the bulbs of Crocuses and Tulips, and also Polyanthuses ; with much work of a purely routine character.

In frames and pits arrange the stock for planting out in the flower-garden next summer. The sooner this is done the better. The great art in keeping these plants healthy is to give a constant and free circulation of air, and keeping them free from over moisture ; whenever the weather will allow, give air day and night ; but take care and mat up safely from frosts.

In the conservatory and greenhouse little requires to be done excepting attention and cleanliness ; give very little water, and that with caution ; also let this be done early in the day, so that the moisture may dry up before evening ; clear away all decayed and decaying leaves ; keep a good circulation of pure air ; allow the plants to stand at a good distance from each other, as crowding at this season is particularly injurious, and use no fire unless the weather is excessively wet or frosty.

In the stove and forcing pit, expose the plants to as much light as possible ; be careful not to overload the atmosphere with moisture or give much to the plants ; allow a good portion of air whenever the weather will permit, and begin to introduce Roses, Lilacs, Lilies of the Valley, and other plants, to bring them early into bloom ; and watch after and destroy the insects as they appear.

In the Orchid house be careful that all the species in a state of repose be kept free from every kind of excitement ; give no water at the roots, a very moderate degree of atmospheric moisture, and a fair supply of air, when it can be safely admitted ; those in a state of growth or flowering must receive the treatment suitable to those states ; and all will be benefited by having as much light as the season will afford. Cleanliness is of paramount importance.



[illegible]

Dendrobium Farmerii

DENDRÒBIUM FARMÈRII.

(Mr. Farmer's Dendrobe.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.
(Orchids, *Veg. King.*)

Generic Character.—*Sepals* membranaceous, erect, or spreading; lateral ones largest, connate with the column at the base. *Petals* often much larger than the sepals, sometimes smaller, always membranaceous. *Labellum* jointed or connate with the foot of the column, always sessile, undivided or three-lobed, commonly membranaceous, sometimes appendiculate. *Column* semi-cylindrical, much prolonged at the base. *Anthers* two-celled. *Pollen masses* four.

Specific Character.—*Plant* an Epiphyte. *Pseudobulb* angular. *Stems* jointed, swelling at the joints, pendulous, leafy towards the summit. *Leaves* oblong, acute, nervose. *Racemes* lateral, many-flowered; longer than the leaves. *Bracteas* situated at the base of the pedicels, plicate, recurved. *Sepals* spreading, ovate, obtuse, of a rich and delicate rose colour. *Petals* larger, of a pale straw colour, ciliated. *Labellum* broad, almost inclining to a square, clawed, ciliated, blunt, of a pale straw colour, varied with a deep yellow blotch.

Authorities and Synonymes.—Dendrobium, *Swartz.*

The specimen of this beautiful species, from which our drawing was prepared, was imported by W. F. G. Farmer, Esq., through Dr. Mc Clelland, of the Calcutta Botanic Garden, who sent it in October, 1847. It was named in the invoice, and labelled as *Dendrobium densiflorum*, which in habit and appearance the plant very much resembles; but the stems are more angular, and the flower-scape is less densely laden with bloom; the flowers too are altogether different.

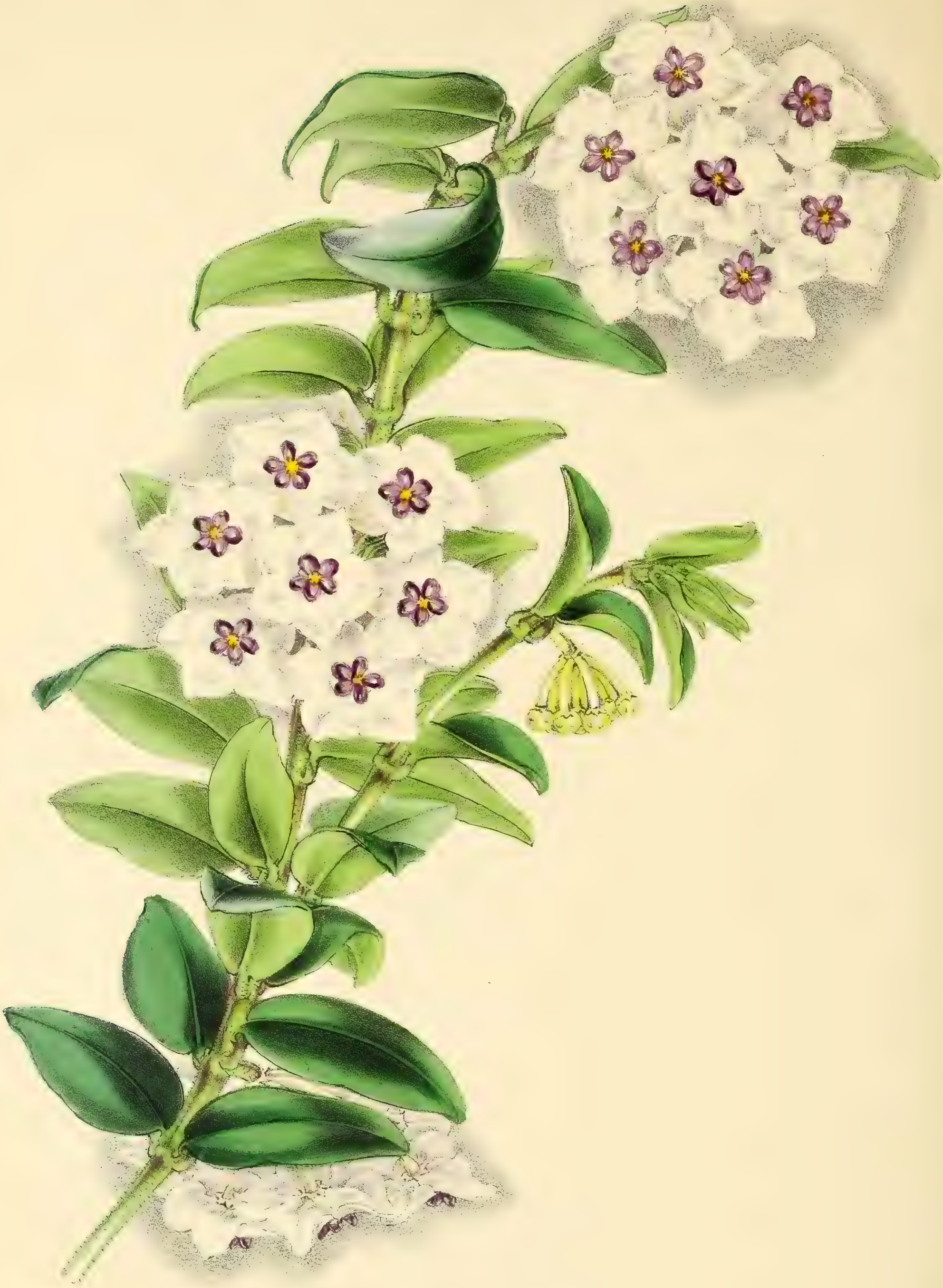
Mr. Carson, the intelligent gardener at Cheam, exhibited the plant when in bloom, at the Horticultural Society's Room, Regent Street, in March last, when it was awarded a Banksian Medal.

It does not appear to require any other treatment than that given to *Indian Dendrobes* generally. Mr. Carson grows it in chopped sphagnum moss and peaty heath mould, with broken potsherds, and an abundance of drainage. It is by no means a robust grower, but when in flower is quite a gem, and a great acquisition to this lovely genus.

Our drawing was made in March, 1848, from a specimen which flowered in the stove of W. F. G. Farmer, Esq., at Nonsuch Park, Cheam, Surrey.

Propagation may be effected by detaching one of the stems while in a torpid state, taking care not to injure the roots.

The generic name is derived from *dendron*, a tree, and *bio*, to live, because the plants are usually found existing on trees.



S. Holden, del & Lith

Hoya bella?

HOÝA BÉLLA.

(Beautiful Hoya.)

Class.
PENTANDRIA.

Order.
DIGYNIA.

Natural Order.
ASCLEPIADÀCEÆ.

(Asclepiads, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* short, five-leaved. *Corolla* rotate, five-cleft. *Stamineous Corona* five-leaved; leaflets depressed, spreading, fleshy, drawn each out into a tooth on the inner side, which lies on the anthers. *Anthers* terminated by a membrane. *Pollen masses* fixed by the base, connivent, compressed. *Stigma* depressed, mutic or sub-apiculated. *Follicles* smooth. *Seeds* comose.—*Don's Syst.*

SPECIFIC CHARACTER.—*Stems* branching, weak but copiously leafy. *Leaves* opposite, scarcely so big as those of the large-leaved Myrtle, and nearly of the same shape, ovate, but fleshy, one-nerved, dark green above, pale beneath. *Peduncles* lateral, about as long as the leaf, each bearing a corymb of from eight to ten flowers. *Calyx* a little downy, of five elliptical, spreading *sepals*. *Corolla* rotate, convex, nearly white, waxy, with five acute angles rather than lobes; alternating with these angles, and occupying the centre of the flower, are the five leaflets of the *Staminal crown*, ovate or rather cymbiform, concave and deep purple on the upper face, pale below.—*Hooker* in *Bot. Mag.*, 4402.

AUTHORITIES AND SYNONYMES.—Hoya, *R. Brown;* Asclepias, *Linn.;* Hoya bella, *Hooker* in *Bot. Mag.*, t. 4402.

THE old *Hoya carnosa*, with its pendulous corymbs of wax-like flowers, replete with honey, and filling the house it inhabits with its rich, but peculiar fragrance, is too well known to need description.

Many newly-discovered species have of late years been introduced, and some have flowered, but with two exceptions none have equalled the old favourite above mentioned.

Our present subject, however, is superior in every point of view, the flowers for delicacy and beauty surpass all the kinds yet known; the habit of the plant is not climbing, nor does its general growth at all resemble that of *H. carnosa;* the branches are slender, numerous, and thickly clothed with small leaves, scarcely so large as those of the broad-leaved Myrtle, and not much unlike them in form.

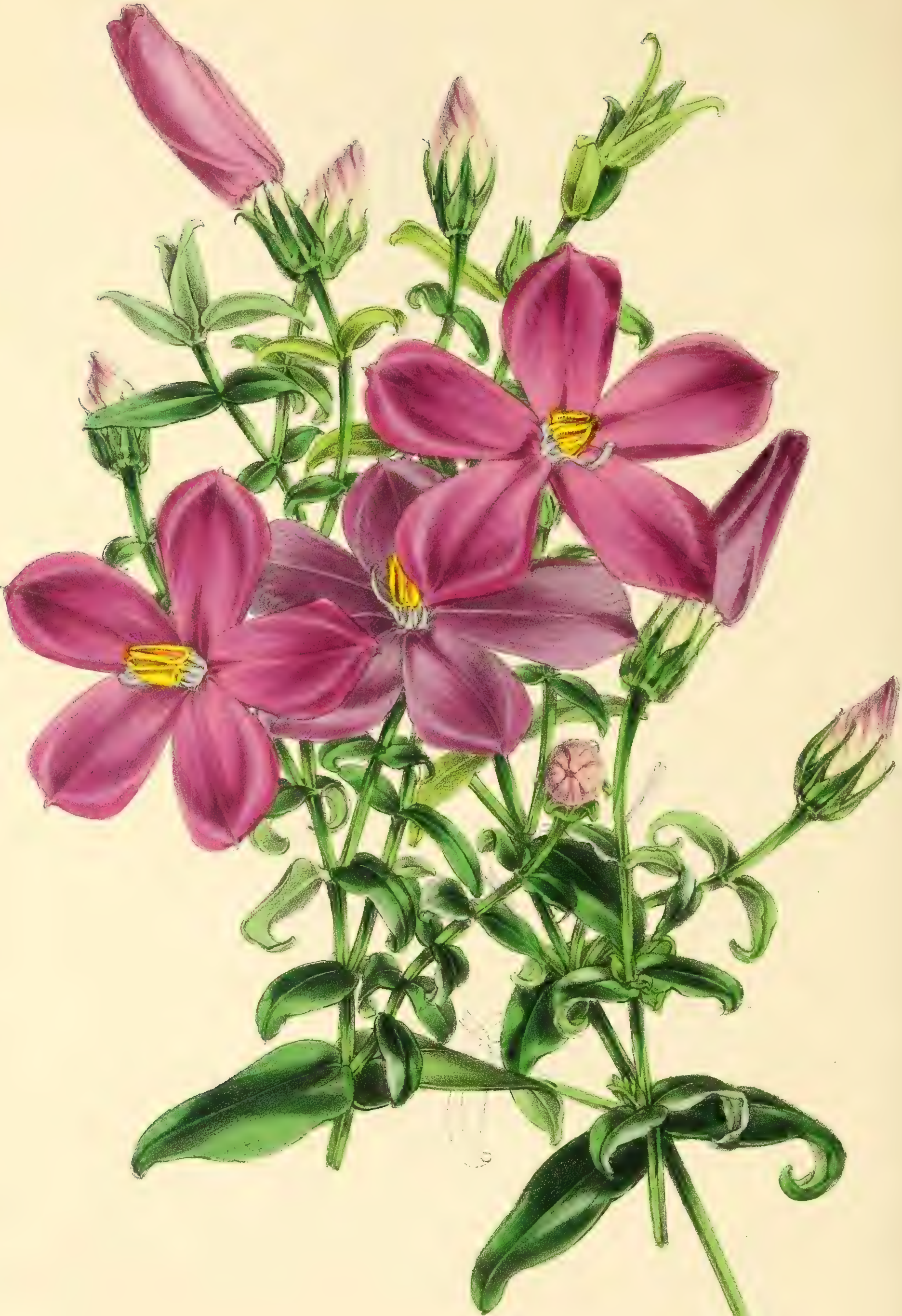
The flowers are not only beautiful individually, but the corymbs are viewed to great advantage, from the circumstance of so large a proportion of green foliage forming a dense back ground; the petals are of a very pure white, and beautifully frosted; the central corona of fructification is of a rich carmine purple, and forms a very striking and lively contrast to the petals. Altogether it is a plant of first rate importance in a collection, as the flowers endure in perfection for a long time, and are delightfully fragrant.

It is a native of the Taung Kola Mountain, Moulmein, where it was discovered by Mr. Thomas Lobb, and through him introduced by Messrs. Veitch and Son to this country.

Our drawing was made in the nursery of Messrs. Veitch and Son, of Exeter, in August 1848, from a fine specimen which had been in bloom for many weeks.

Its treatment is much the same as that of an *Æschynanthus*, requiring during the season of growth a warm humid atmosphere, but very little moisture during its torpidity in winter.

The name was given in honour of Mr. Thomas Hoy, at one time gardener at Sion House, Middlesex, an intelligent and successful cultivator of plants.



S. Holden del & Lith.

Chironia glutinosa.

CHIRÒNIA GLUTINÒSA.

(Glutinous Chiron.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
GENTIANÀCEÆ.

(Gentian-Worts, *Veg. King.*)

Generic Character.—*Calyx* five-parted. *Corolla* salver-shaped, with a narrow tube, and a spreading limb, which is longer than the tube. *Stamens* five; *filaments* broad, short, rising from the top of the tube; *anthers* oblong, erect, connivent, at length spirally twisted. *Style* declinate, a little longer than the stamens. *Stigma* capitate, assurgent. *Pericarp* one-celled, two-valved. *Seeds* numerous.—*Don's Syst.*

Specific Character.—*Plant* an evergreen sub-shrub, three to four feet high, of a dark rich green. *Stem* smooth, much branched; branches rather succulent, spreading. *Leaves* three to five-veined, opposite, ovate-lanceolate. *Flowers* large, two inches or more in diameter, of a bright red-lilac colour. *Calyx* five-parted, acuminated; tube shorter than the corolla. *Corolla* persistent, limb expanded, five-parted, each part of an equal size. *Stamens* longer than the tube of the corolla.

This fine species of Chironia was first detected as a poor and insignificant-looking plant, cast aside as rubbish, in the Hull Botanical Garden, four years ago. The curator there is said to have raised it from seeds received from Australia, but of this nothing certain can be ascertained.

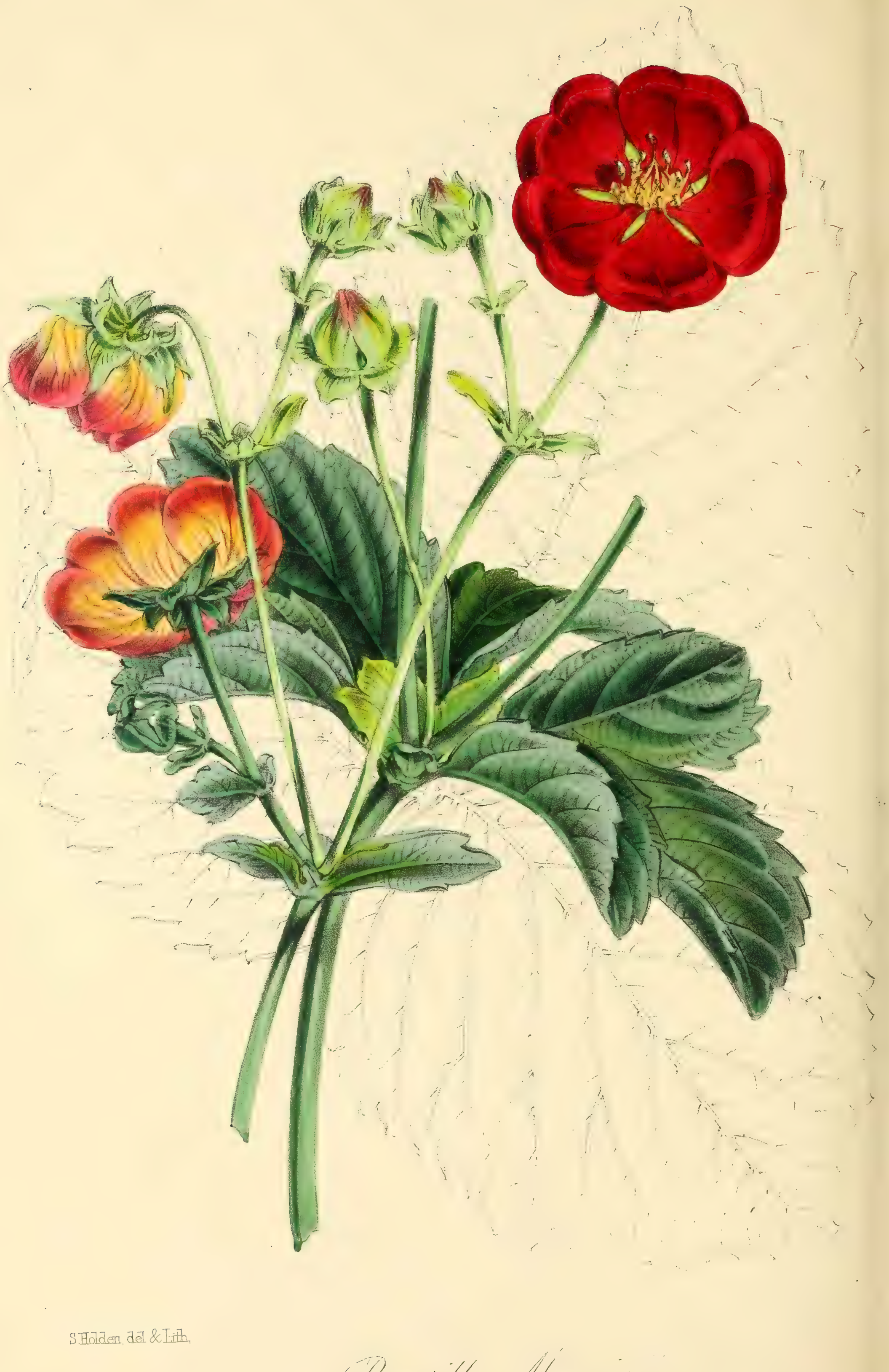
It is a greenhouse plant, and forms a very neat-growing shrub, with a good bushy habit, and is covered with a profusion of flowers for many months in the year.

The cultivation of the plant is easy: a mixture of loam, peat, and well-rotted leaf mould in equal parts, is the most suitable soil.

Like the other species of Chironia, the main things essential to maintain this plant in good health and rapid growth are—allowing the roots sufficient room to extend, and preserving a regular but not over abundant quantity of humidity in the soil and atmosphere. Also, at the time of potting, above an average quantity of broken crocks is requisite for drainage. An airy place in the greenhouse should also be selected, where it can enjoy a strong light. And lastly, in winter, water must be supplied very sparingly.

It is increased by cuttings, which strike easily if planted in sand, and the pot placed in a little bottom heat.

The generic name is given in honour of Chiron, the Centaur, one of the earliest practitioners whose names have been preserved. The intense bitterness of the genus indicates its powerful tonic properties.



S. Holden, del & Lith,

Potentilla Menziesii

POTENTÍLLA MENZIÉSII.

(Mr. Menzies' Cinquefoil.)

Class.
ICOSANDRIA.

Order.
POLYGYNIA.

Natural Order.
ROSÀCEÆ.
(Rose-worts, *Veg. King.*)

GENERIC CHARACTER.—*Calyx* tubular, concave; limb four to five toothed, with four or five bracteæ. *Petals* four or five. *Stamens* indefinite. *Carpella* indefinite, inclining to the side of the style, attached to the receptacle, persistent, dry, capitate. *Seeds* protruding.

GARDEN HYBRID.

THE flowers of this very fine hybrid are large, and very showy, of a deep and rich colour, and are produced in the greatest profusion, making a fine appearance in sunny weather.

It has been named in compliment to Mr. Menzies, gardener to H. Edwards, Esq., Hope Hall, near Halifax, who raised it a short time ago from seeds.

More than 170 species of Potentilla are known, and have been described; and in addition to this great number, an almost innumerable quantity of hybrids have from time to time been raised by various practical men, some of which possess great beauty, and are extensively cultivated. *P. Menziesii* holds no inconspicuous place amongst the latter: it forms a most excellent border plant, will grow three feet or more high, and bushy in proportion; and in a situation and soil suitable, the entire surface will become clothed with its brilliant coloured flowers.

All that is requisite in the cultivation of this plant, is to furnish it with a moderately rich loamy soil, and a well-drained airy situation on the borders; and should the summer prove dry, administer a good supply of water.

Propagation is effected by division of the roots in the autumn or early spring, the former is the best.

Our drawing of this fine plant was made in the nursery of Messrs. Knight and Perry, King's Road, Chelsea, where it flowered finely in August last.

The generic name is derived from *potens*, powerful, from the supposed medicinal properties of some of the species.

CULTURAL CHEMISTRY.

(*Continued from page* 229.)

The substances to which the term Inorganic Elements has been of late injudiciously applied, now claim attention. They consist of those earthy, mineral matters, which abound in the soil, and are occasionally present in plants, though not referable to the atmosphere, its constituent gases, or to other gaseous fluids adventitiously combined with it. At the period when Sir Humphrey Davy paved the way to the introduction of chemical science, by his Lectures before the Board of Agriculture, from the year 1802 to 1812, the analysis of earths and soils by chemical re-agents became the order of the day; and, adopting the processes described by that philosopher in his Lecture IV., commencing at page 141, Edit. 4th of his "Elements," numbers of experiments were performed, which led to the conclusion, that the main constituents of a highly fertile natural loam were silicious sand, fine silica, alumina or the base of clay, carbonate of lime or chalk, and oxide of iron; being five purely mineral matters, which were viewed as the essential bases of all earths capable of supporting vegetable growth.

Practical men, however, became dissatisfied with the results of such experiments, which, they began to think, led to no real utility. Enquiry, therefore, was for a time arrested, or made small advances in England, although it must be confessed, that on the Continent men of enlarged mind and great analytic skill, persisted in a series of researches which have led to important discoveries. Professor Johnston, to whom we have so frequently appealed, thus expresses himself, in a note on Analysis, which appears at page 224 of the "Royal Agricultural Journal," No. XXI.:—

"In this branch of applied science, I know of few things more difficult than to give a safe and practically useful interpretation to the numerical results obtained from the analysis of a soil; and I can well understand the sources of the opinion that the analysis of a soil is of no use. It requires much knowledge of practical agriculture to see their value, or to understand what the numbers indicate." This remark holds equally with horticulture; and in another place Mr. Johnston refers to the results likely to be obtained in a large trial garden, conducted by competent persons. In fact, the thousands of subjects which the general horticulturist has to deal with, urge the importance of scientific investigation, with peculiar force.

"When a really well-instructed chemist," adds Mr. Johnston, "ventures to pronounce the minute and rigorous analyses of soils of no use, I feel only regret that the weight of his opinion should be thrown in the way of a means of improvement, which, if he knew more of practice, he would see was not only largely available, but in many cases almost indispensable to a safe expenditure of money upon the land."

The real difficulty, which presents itself as an almost insurmountable obstacle to the effective analysis of earths and soils, is the vast variety which exists, even at the slightest distances. As, for example, a pound of earth from a certain bed or plot, is sent to a chemist; he subjects a given portion of it to the customary tests, enumerates the results, tabularly, to the party, and states the deficiency or redundancy of one or other of the usual constituents. It is quite evident, that if every inch of the soil were precisely the same, analysis, accurately conducted, must be determinate in its results. But the fact is not so. In the same garden the constituents may and do differ in every particular, and in thousands of instances, to a most perplexing extent. Hence, unless an entire plot, of very large dimensions, has been so laboured and comminuted as to bring the whole staple—soil and subsoil—to one homogeneous temperament, an analysis conducted by the most enlightened chemist must be unavailable to the practical cultivator.

The mineral constituents of a soil, according to the sense adopted by Davy, Henry, and others, some five-and-thirty years ago, were then the chief constituents sought for. The vegetable, or organic and fibrous matters, were in the first instance separated by the sieve, or destroyed by a gradual and progressive combustion, and their quantity determined by loss of weight. Thus, in the 400 grains of earth analysed by Davy, according to the table at page 158 of his "Elements," 29 grains of vegetable fibre were detected. The cretaceous matter existing, as carbonate of lime, was separated by the action of muriatic acid, which also dissolved some portion of the iron. These were precipitated by appropriate re-agents, washed, dried, and weighed. Sulphuric acid was next employed, to dissolve the alumina, and what oxide of iron was in the soil after the action of the muriatic acid. The earth remaining after the sulphuric acid was understood to be chiefly sand and fine silex. Davy observes, "The method of analysis by sulphuric acid is sufficiently precise for all usual experiments;" and so it would be, were modern chemists satisfied by the mere detection of flint, clay, carbonate of lime, and iron; but science now speaks a very different language, and aspires to higher pretensions. It has determined the great and important fact, that soil, to be available to the perfecting of all vegetable productions, must contain at least the twelve following chemical constituents, eight of which have metallic bases, namely, silica, alumina, carbonate of lime, iron, in the form of protoxide, peroxide, or both, manganese, magnesia, potassa, and soda; also three acids in combination with one or other of the preceding substances, namely, the sulphuric, hydrochloric, and phosphoric acids; and finally some organic matters. Silica is the pure matter of flint and sand; it consists of the metaloid *silicium*, combined with oxygen. Alumina is an oxide of aluminum, but is never found pure in the earths. As silicious sands form the bulk of all fertile land, usually to the amount of 75 to 90 per cent., and even in stiff clays to half that quantity, so alumina confers adhesiveness and closeness of texture on soils. In clays, alumina exists to the extent of little more than 30 per cent., whereas only one-third of that quantity can be traced in 100 parts of a soft, unctuous loam: in some sandy earths it constitutes less than one hundredth part of their substance. Alumina gives temperament to the land, and by its adhesive power the roots of plants are secured and firmly retained in their exact position; but chemically, it is nearly inert, and rarely is traceable in the ashes of any plant.

Chalk.—Carbonate of lime is found in extremely varying proportions. Chemically, it consists of pure lime neutralised by about 44 parts in 100 of carbonic acid, or as 56 of lime to 44 of the acid. Lime, pure, is never found in soils; it is an oxide of the metal *calcium*, discovered by Davy, anno 1808. Some earths contain scarcely a trace of chalk; such are the sandy heath-soils and others, wherein silicious sand is the chief ingredient. In the best loams we frequently detect more than one-twelfth part of their weight; and in districts where chalk rock is found near the surface, a far greater proportion is brought up and mixed with the earth. Chalk is slightly soluble in water, and plants absorb more or less of it, a proof of which is given by analysis of their ashes.

Oxide of iron confers colour according to the condition in which it is blended with the several earths. When 28 parts of metallic iron combine with 8 parts of oxygen, a black oxide is the result. As such, it gives a black or dark grey tint to soils. But there is another condition—that of the *per*-oxide, wherein 12 proportionals of oxygen are combined with 28 of the metal; in this state the colour varies according to the method by which it has been obtained, from that of a pale ochreous yellow to a full Roman red. Hence may, to a certain extent, be traced the varied colours of the soil, though it must be admitted that much will depend upon the nature of the vegetable substances that are combined with the earths. The quantity of iron is small—seldom more than 2 per cent., yet it is found in the ashes of many plants, and therefore must be essential to them. On a former occasion it was stated that the writer experimented freely with a solution of sulphate of iron poured over the soil of a small pot, wherein a white-stemmed Balsam was growing. It was employed so long and so freely, that at length the simple loam of the pot was, in appearance, converted to a rust of iron. The object of the experiment was to determine the channels of the ascending sap. *That* was not however, attained, for the plant refused to imbibe the ferruginous liquid; but it became crippled, though not killed, the stem assuming a contorted figure. Not a trace of colouring matter was discoverable in the tissues. It were well to repeat such experiments under several modifications, and the balsam is peculiarly favourable to them; so would be the *Oleander*, as its proper sap contains, if we mistake not, gallic acid, and hydrocyanic (Prussic) acid.

Magnesia is found in soils, and also in the ashes of some plants, as is shown where the delicate tests of ammonia and phosphoric acid are skilfully applied. The mention of phosphoric acid leads to the consideration of the great importance which is now attached to it by modern chemical research. It is produced by the combustion of that singular combustible *Phosphorus* in oxygen gas. In nature, phosphoric acid is never found alone; it is combined to a great extent with lime in animal bones, and in some native phosphates, of which the Coproliths, and certain portions of the green-sand formation are notable examples. Of the origin of *Phosphorus,* at present viewed as an elemental base, more will be said.

The alkalies, *Potassa* and *Soda,* are discovered in soils; not, however, in their pure state, and hence their presence was not formerly appreciated; but as the bases of neutral salts in the form of silicates, muriates, or sulphates: all these and a small quantity of manganese, constitute what are now deemed the *in*-organic, mineral constituents of vegetable bodies, attracted and taken up by the vital absorbent action of their roots, from the soil.

To enable the reader to estimate the results of a modern process of analysis, the following tables are given from the new edition of Mr. Stephen's "Book of the Farm," the first part of which was brought out late in October:—

	Soil Surface	Subsoil 15 in. deep	Subsoil 30 in. deep
Organic Matter and Water combined	8·324	7·700	9·348
Humic acid	2·798	3·911	3·428
Crenic acid	0·771	0·731	0·037
Apocrenic acid	0·107	0·160	0·152
Potash	1.026	1·430	1·521
Soda	1·972	2·069	1·937
Ammonia	0·060	0·078	0·075
Lime	4·092	5·096	2·480
Magnesia	0·130	0·140	0·128
Peroxide of Iron	9 039	10·305	11·864
Protoxide of Iron	0·350	0‘563	0·200
Protoxide of Manganese	0·288	0·354	0·284
Alumina	1·364	2·576	2·410
Phosphoric acid	0·466	0·324	0·478
Sulphuric acid	0·896	1·104	0·576
Carbonic acid	6·085	6·940	4·775
Chlorine	1·240	1·382	1·418
Soluble Silica	2·340	2·496	2·286
Insoluble silicates	57·646	51·706	55·372
Loss	1·006	0·935	1·231
	100·000	10·0000	100·000

The first four are decomposable organic substances. The alkalies and acids exist in combination, but are here exhibited separately, as detached and severed by the analytic processes. The *ammonia* must be adventitious, brought down by rain, or extricated within the soil by chemical disturbance among the Organic elements.

The deduction we must arrive at by a comparison of the elements given in the foregoing tables with the products of combustion, is this:—Plants contain certain substances, which are deposited in their ashes; they are saline and earthy ingredients that by no reasonable probability could be derived from the air. The analysis of a soil yields corresponding substances; therefore, to the soil we must refer as their origin; and upon this fact depends the theory of appropriate manuring. But till science shall have arrived at a point which shall clearly determine the balance of supply and demand, our knowledge of the inorganic constituents in soils, and of the materials we should supply to them in order to meet the demands of plants, must be considered in a state of infancy.

If we now revert to the composition of sea-water, as stated in a recent article, it perhaps will appear that all the saline matters traceable in native earths have been originally derived from the waters of the ocean. In them we find potassa, soda, lime, and magnesia, in combination with the sulphuric and hydrochloric acids. The phosphorescence of decaying fish points to the origin of phosphorus, as does also the presence of much phosphoric acid in combination with ammonia, soda, potassa, and magnesia, in the best guano. The sea has for an unknown period covered the entire surface of the globe; therefore without appealing to the strong evidences offered by geology, it may, without presumption, be inferred that the sea was the original depositor of all those chemical inorganic substances which have formed the subject of this article. Offering these suggestions with a view to excite inquiry and research, we leave them to the serious reflexion of our philosophical friends, and thus bring our labours of the present year to a close.

THE HYSSOP OF THE ANCIENTS.

Hyssop or Ezob, appears to have been a plant well-known to the ancients, and much esteemed by them for medicinal purposes, but to what species the name was applied, or even to what genus it is referable, is not easy to determine.

The vulgar opinion has generally been, that the bitter herb grown in our gardens under that name, and used by us for domestic purposes, is identical with the Ezob of the ancients: our plant, however, is a native of the south of Europe, and although one variety, the *H. orientalis*, grows naturally on Caucasus, and other parts of Central Asia, yet it has never, as far as we know, been discovered in a wild state either in Lower Egypt, the Desert of Sinai, Syria, the neighbourhood of Jerusalem, or any of the adjacent countries; whilst the true Ezob must, from the uses to which it was applied by the Jews, have been found naturally in all those localities. This, in connection with other reasons, has led scientific men to the unanimous conclusion, that the Hyssop of our gardens is a distinct plant from the Ezob of the ancients.

In continuation of the above remarks we may observe, that the name *Hyssop* appears to have been derived from the Hebrew אזוב, *Ezob* or *Ezeb*, signifying a holy herb, or a herb for purifying, and the pronunciation of it is nearly the same in all Europæan, and in some Asiatic languages.

The French call it *Hysope*, the Germans *Der Isop*, the Italians *Isopo*, the Spanish *Hisopo*, the Portuguese *Hyssopo*, the Danish *Isop*, the Dutch *Hysop*, the Greek ὑσσωπος, *Hyssopos*, the Hebrew *Ezob*, *Ezobh*, and *Ezof*, and the Chaldaic *Esofa*.

It is frequently mentioned in Sacred History, where some of the uses to which it was formerly applied are described, and from which we must naturally conclude that the plant grew wild in the parts where the persons using it were then located.

The first mention of the plant in Sacred History is in connection with the institution of the Passover, where the Israelites were commanded to take a bunch of the herb, and with it sprinkle the blood of the Paschal Lamb upon the lintels and posts of their doors. See Exodus, c. xii., v. 22. It was also used by the Jewish Priests in their ceremonies of cleansing persons afflicted with leprosy, and for purifying the houses of lepers. See Leviticus, c. xiv., v. 4, 6, and 52, and Numbers, c. xix., v. 5. To this use allusion is made in Hebrews, c. ix., v. 19, and in Psalm xli., v. 2. In 1 Kings, c. iv., v. 23, it is mentioned incidentally, as a plant "which groweth out of the wall," and from its connection there, conveys the idea of a minute herb, in opposition to the Cedar of Lebanon, as a timber tree. The same plant is also supposed to be mentioned in the Gospel of St. John, c. xix., v. 29. Pliny, too, in his writings, mentions it as not good for the stomach: he says the Romans used it with figs, as a purgative; with honey as an emetic, and that they also made it into a plaister, with other herbs, as a cure for the sting of venomous reptiles. The situations in which it grew wild, he mentions, as Mount Taurus in Cilicia, in Pamphylia, and in Smyrna, localities in which the Hyssop of our gardens has never, that we are aware of, been discovered.

Various opinions have been mooted by writers and travellers respecting the species of plant thus referred to in history, and which was so highly prized. Some have conjectured, from the incidental notice of it, given in the Book of Kings, that it was a minute species of moss; and as the *Gymnostomum truncatulum* (*a*), grows abundantly on the walls and ruins about Jerusalem, and also in Lower Egypt, and the Desert of Sinai, it has been selected as a very probable kind for the true Hyssop. The plant is very minute and curious, and seems to agree with the idea conveyed in 1 Kings, where Solomon is mentioned as having written on plants, from the "cedar of Lebanon to the Hyssop that groweth out of the wall;" apparently pointing to the two extremes of the vegetable creation.

Others, for the same reasons, have supposed another species of moss to be the true Hyssop; it is called *Trichostomum aciculare* (*b*), and, like the last, it is indigenous to Britain, but is found abundantly in all the localities where the ancient Hyssop is recorded as growing.

The objections advanced against these species of moss are, that their Arabic names do not in any respect favour the supposition; nor do they possess any of those medicinal properties, attributed to the Jewish Ezob.

A minute species of fern also has been selected; but the same objections apply here as to mosses.

Others have thought the Judæan wormwood (*Artemesia Judaica*) a likely plant. It is a little evergreen shrub, growing from a foot to eighteen inches high, in all the countries where the true Hyssop must have grown; but the habits do not agree with those of the ancient Hyssop, as it is never found naturally growing upon rocks or walls: and, besides, it is distinctly mentioned in Sacred History by another name.

Of *Labiates*, three plants have received a share of attention. The first is the Winter Savory (*Satureia montana*), which possesses the properties, grows in the localities, and has similar habits to those of the Hyssop; but Pliny notices it as a cultivated herb, which was used by the Romans as a spice in their cookery and medicine.

Rosemary (*Rosmarinus officinalis*) has also had its supporters; but it does not grow in all the required localities.

Perhaps the *Labiate* which claims the greatest share of our attention, is a variety of the common Hyssop, usually known by the name of *Hyssopus orientalis.* It is the *H. officinalis angustifolius* of Bentham, and the *H. Caucasica* of Sprengel. The leaves are very narrow, the stems slender, and altogether the plant is of a much less size than the common Hyssop of our gardens; the habits and properties also correspond with those attributed to the Jewish Hyssop; but the localities are remote, it being found in a wild state on Caucasus, and other parts of Central Asia, but never in Egypt or Arabia.

None of the above species, therefore, appear to possess all the requisites of the true Hyssop. In June, 1844, Dr. Royle read before the Asiatic Society, an interesting paper, to prove that the Caper plant is the Hyssop of the ancients.* The Doctor's attention was first drawn to this subject, from observing that in Rhases, there were two kinds of Hyssop known. One of these grows in the neighbourhood of Jerusalem and about Mount Sinai, in which last place it was discovered by Burckhardt, creeping up the sides of the mountain, like a parasite, and spreading out its numerous slender branches, covered with small thorns, in every direction. The Arabic name also he states to be *Aszef.*

From Burckhardt's name and description, Dr. Royle concluded the common Caper plant must be meant, as it is well known that this, or a nearly allied species, is indigenous both in Lower Egypt, in the Desert, the Mountain of Sinai, and also on the wall and ruins of Jerusalem, in which several situations, it has been found both by Bové and other travellers and writers. The name, also, would seem strongly to favour the supposition that this plant is really the true Hyssop of the ancients, its Arabic name being *Aszef* or *Azuf.*

As all the requisites of the ancient Hyssop appear to unite in the Caper plant, it would seem scarcely philosophical to deem such a coincidence purely accidental—for,

1st. The name in Arabic, *Aszef*, or *Azuf*, bears a strong resemblance to the Hebrew name *Azof*, or *Ezob.*

2nd. It appears to possess the same habits as the Jewish kind, growing on walls and rocks.

3rd. It grows wild in all the localities where the Jewish plant must have been indigenous, for the Israelites to have obtained it.

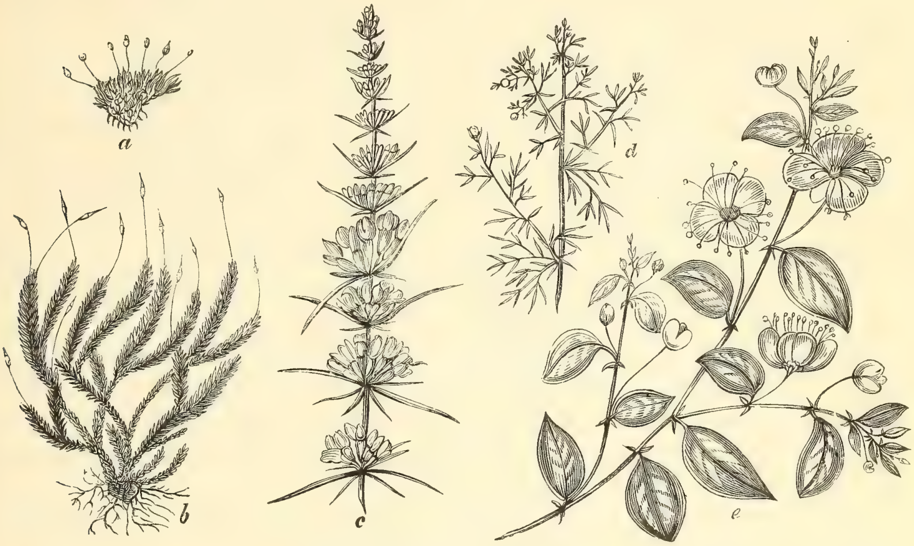
4th. It possesses cleansing or detergent properties.

---

* "Gard. Chron.," 1844, p. 556.

5th. It is said by Pliny to have been used in his day as a cure for a skin disease allied to leprosy.

And 6th. It is at present universally esteemed in the East, and holds a place in some of the Continental Pharmacopœias.



DESCRIPTION OF THE WOOD-CUT.

a **Gymnostomum truncatulum, supposed Solomon's Hyssop.**
b **Trichostomum aciculare.**
c **Hyssopus Orientalis. Eastern Hyssop.**
d **Artemesia Judaica. The Judæan Wormwood.**
e **Capparis Ægyptiaca, or, True Hyssop of the Ancients.**

Such a train of striking coincidences, if not altogether conclusive, go very far to prove that this is the true Hyssop, or Ezob, of the ancients.

A difficulty, however, presents itself, as to the identical species of Caper plant, known in Arabia by the name of *Aszef;* four, if not five, different kinds all grow wild in those localities. The Sodaba Caper (*C. Sodaba*) is a deciduous plant, with small red fruit, and pale rose-coloured flowers ; both the buds and unripe fruit are used, and esteemed as medicinal. The Various-leaved Caper (*Capparis heteracantha*) and White-leaved Caper (*C. leucophylla*) both bear white flowers, and attain the height of four feet. The Common Caper (*C. spinosa*) is a native of the South of Europe and some parts of Asia, and perhaps in the Desert and in Egypt ; but of this we are not certain. It is common in the Mediterranean, and most parts contiguous ; but there appears to be an objection to this being the identical species discovered by Burckhardt and others, as it is mentioned distinctly by ancient writers under the name of *καππαρις*, whereas the Hyssop is called by Dioscorides, *ὑσσωπος*, *Hyssopos*, and by Pliny *Hyssopus*, evidently pointing to two different plants.

The kind which appears to agree in every respect with the description is the Egyptian Caper (*C. Ægyptiaca*), and all things taken together, we cannot but believe this plant to be the true Ezob of the ancients.

SELECTION OF CHOICE GREENHOUSE SHRUBS.

With Yellow Flowers.

Acacia argyrophylla is a tall growing species, with beautiful foliage and large heads of deep yellow flowers, which are produced in the spring months.

Acacia celastrifolia is also very graceful, and the flowers diffuse a most delicious fragrance.

Acacia cultriformis flowers during the early spring months; should have a liberal supply of water, when flowering.

Acacia leptoneura is another very graceful plant, producing in spring a vast profusion of orange-yellow flowers.

Acacia longifolia is a robust-growing kind of considerable beauty.

Acacia oncinophylla is so profuse a bloomer, that its branches appear one mass of flowers, being far more numerous than the leaves.

Acacia rotundifolia, although an old is a very handsome kind. All the above being Australian plants, require an airy situation in the greenhouse. The best soil for them is two-thirds sandy loam, and one part turfy peat, with plenty of potsherds for drainage. Its cuttings strike freely in pots of sand placed in a little heat under a handglass.—*Mag. Bot.*, v. xv., t. 124.

Aotus gracillima.—A very elegant Australian plant with rich orange flowers, which are produced in great profusion; give the same treatment as to Acacias.

Cestrum aurantiacum has very fragrant orange flowers which are abundantly produced; the plant is deciduous.

Dillwynia clavata has a habit stronger, and less disposed to form branches, than most of the other species of the genus, and on that account requires to be freely pruned to render it dwarf and bushy. A mixture of two parts turfy peat, one part light loam, and one part leaf mould; it is the better for being in lumps, and not broken too fine.

Eucalyptus Preisiana forms a handsome tree-like shrub, with foliage as fragrant as a myrtle, and is well worthy of a place in a selection.

Gastrolobium spinosum and villosum are both hardy greenhouse kinds, and appear to be benefited by being placed out of doors during the summer; but the situation must be a sheltered one where the mid-day sun or winds have not full power upon them.

Gompholobium barbigerum is one of the finest kinds of this genus; the flowers are a fine gamboge yellow, and the plant forms a broad-spreading bush.

Gompholobium Hendersoni forms a dwarf shrub, with a stiff but compact habit, and of slow growth. Its flowers are a deep orange and produce abundantly.

Rhododendron Javanicum and R. Javanicum aureum, are two of the most magnificent greenhouse shrubs which have been brought into this country for many years. They require the same treatment as *R. arboreum* and its varieties.

With Red Flowers.

Amongst Chinese *Azaleas* the sorts are almost endless.

CHOROZEMA TRIANGULARE is one of the prettiest plants of the genus; the flowers are a very rich scarlet, the growth compact, and the cultivation easy. The requisites are good turfy peat, free drainage, planting high in the pot, partial shade from the scorching summer sun, a free supply of water, and a security from damp during the winter.

CUPHEA PLATYCENTRA.—One of the best winter-flowering plants we have, and also hardy enough to endure the open flower-borders in summer.

EUCALYPTUS MACROCARPA is a beautiful glaucous-looking plant, with large red flowers, very conspicuous.

LESCHENAULTIA SPLENDENS.—A fine companion to *L. formosa*, and *biloba*. The flowers are of so bright a scarlet, that when the plant is covered with them, their effect is so dazzling, that in sunny weather it is difficult for the eye to rest upon them.

RHODODENDRON ARBOREUM PAXTONI resembles the old *R. arboreum*, but is in every respect very superior to it; in fact, it may perhaps be said that it is the most splendid Rhododendron known.

Of CORRÆAS many may be mentioned, but the garden varieties called *brilliant*, *picta*, *rubra*, *curiosa*, and *pulchella*, are held in high esteem, and, being winter and early spring-flowerers, may be classed amongst our first-rate plants.

With Rose-coloured Flowers.

APHELEXIS HUMILIS and MACRANTHA produce a great profusion of bloom, the individual flowers are large, of a delicate rose, and being what are popularly termed everlasting, continue in perfection for a great length of time.

CAMELLIA JAPONICA MINIATA is a most superior hybrid, and deserves to be in every collection.—"Mag. Bot."

Of EPACRISES, three kinds, figured in "Mag. Bot.," v. xv., t. 193, under the names of *campanulata maxima*, *bicolor*, and *delicata*, deserve to be added to the already fine collections of this genus grown. They are stated, at t. 193, to have been raised by Messrs. Low and Son, which was a mistake: they were raised by John Wilmore, Esq., of Oldford, Birmingham, the gentleman who was so fortunate as to raise *Erica hyemalis Wilmorii*, and several other very good things. *E. Tauntoniensis*, also, is a very good hybrid, with a habit very much like that of *E. impressa.*

GAYLUSSACIA PSEUDO-VACCINIUM.—A compact evergreen bush, resembling a small Arbutus, with racemes of rich rose-coloured flowers, and of the easiest cultivation. It thrives in sandy peat and leaf-mould, and requires the same treatment as Cape Heaths, and is propagated by seeds and layers; the latter should be laid down just before the growth commences, in spring.

INDIGOFERA DECORA.—A first-rate winter-flowering plant; it is a Chinese plant, and will grow in almost any light sandy soil, but especially in sandy peat. Our plants at Chatsworth are almost continually in bloom. The requisites are plenty of water and air in summer; but in winter a very limited supply, and a light and airy situation in the greenhouse. Propagation is easily effected by cuttings.

Of FUCHSIAS, the MACRANTHA and SPECTABILIS, but especially the latter, recently introduced from Peru by Messrs. Veitch, is not to be surpassed by any kind known; the flowers are very large, of a most brilliant colour, and are produced in vast profusion.

OXYRAMPHIS MACROSTYLA.—A very pretty deciduous shrub, flowering in the autumn months. It should be potted in sandy loam and peat, and may be increased by cuttings of the half-ripened wood.

THIBAUDIA PULCHERRIMA.—Perhaps a more beautiful thing than this can scarcely be conceived. The flowers are abundantly produced on the old wood, and are of the richest rose colour, variegated with a deeper red.

With Purple Flowers.

BURTONIA CONFERTA, PULCHELLA, and VILLOSA are all three very fine kinds, but perhaps *B. pulchella* is the handsomest in colour.

GOMPHOLOBIUM VENUSTUM.—A slender and very graceful growing species, with flowers of the richest purple.

SOLANUM LYCIOIDES is a charming Peruvian shrub, with a neat, stiff habit, and flowers of the richest purple, with a yellow eye. It thrives in sandy loam and rough peat, and requires to be placed out of doors in summer, and brought in again in September, when it will flower freely during the winter. Increase is effected by cuttings.

PRONAYA ELEGANS.—A very free flowerer, and ought to be in every collection.

TETRATHECA HIRSUTA and VERTICILLATA.—Very gay plants, requiring in summer plenty of air and water, and in winter to stand in a dry, airy place. Sandy loam and rough peat, with a few potsherds mixed, and with good drainage, are amongst the chief requirements.

SWAINSONIA CORONILLÆFOLIA.—An old but very gay plant, almost always in flower, and very easily grown, and propagated by cuttings.

With White Flowers.

GARDENIA FORTUNI ought by all means to be added to every collection of greenhouse plants. The leaves are like those of *G. florida*, and the flowers are as large as those of a Camellia, and exceedingly fragrant.

With Blue Flowers.

ALONA CŒLESTIS bears flowers like those of *Nolana paradoxa*, the foliage is like that of an Erica, and the cultivation is easy.

HOVEA LINEARIS and other species recommend themselves by their neat growth and bright blue flowers. The culture is the same as other New Holland plants.

HYDROLEA SPINOSA is little known, but more easily cultivated than many other greenhouse plants. The flowers are of the most brilliant cobalt blue. Propagation is effected by cuttings.

NOTICES OF A FEW HANDSOME HERBACEOUS AND DWARF SHRUBBY PLANTS,

SUITED FOR BEDDING OUT IN THE FLOWER-GARDEN DURING THE SUMMER SEASON.

THE chief reason for bringing the following selection of plants before the notice of our readers at so apparently inappropriate a season as the present, is, that all interested in furnishing their flower-beds with novelties may have an opportunity of seeing some of the bloom before the cold weather totally destroys their beauty, so that such selections may be made as may suit the soils and situations of their different gardens. If these notices had been postponed until spring, the flowers could not then have been seen, and the purchaser must have depended upon the descriptions and judgment of others. If the remarks had been supplied earlier, the appearance of the plants on the approach of the cold nights of autumn would not have become visible, and a selection without this knowledge might not have been so satisfactory, as in many places a late autumn bloom is of very great importance, and there are very many plants which make a fine show during the warm summer months, which immediately, as the nights lengthen and become colder, appear starved and shabby.

With Blue Flowers.

ANCHUSA PETIOLATA, *Stalked-leaved Alkanet.*—A very pretty showy perennial, growing about a foot high, a native of Nepal; will grow in any light soil, and is propagated by divisions and cuttings.

BRUNONIA AUSTRALIS, *Southern Brunonia.*—The flowers are of a very rich hue, and emit a pleasant fragrance. The habit is neat, and stature low; it is well calculated for a small bed in a warm situation in the flower-garden. It is a native of Australia. For further particulars refer to "Mag. Bot.," v. vii.

CAMPANULA FRAGILIS HIRSUTA, *Hairy fragile Bell-flower.*—This is usually grown in a pot in the greenhouse; it also makes a very pretty show in a dry and warm situation in the flower-garden, but will not endure much wet.—"Mag. Bot.," v. xi., t. 25.

ECHIUM PETRÆUM, *Rock Bugloss.* A beautiful herbaceous plant, a native of rocks, in Dalmatia. It is a gay little plant, grows about nine inches to a foot high, and succeeds well in a light dry soil, and warm situation. Its chief flowering season is spring.

LOBELIA CŒLESTIS.—A very pretty dwarf-habited plant, growing about nine inches in height, with very bright blue flowers, which are produced during the whole of the summer.—"Mag. Bot.," v. xv., t. 103.

LOBELIA ERINUS GRANDIFLORA, *Large-flowered Erinus.*—Well suited for very small beds. The flowers are larger, and of a darker colour than the species.—"Mag. Bot.," v. x., t. 75.

MALVA CAMPANULATA, *Bell-flowered Mallow.*—This, if planted out in May, makes a beautiful bed, continuing to produce its bloom until the beginning of October. It is propagated both by division and cuttings, treated in the usual way.—"Mag. Bot., v. ix., t. 173.

MULGEDIUM MACRORHIZON, *Large-rooted Mulgedium.*—Although the flowers of this plant are those of Succory, yet Dr. Lindley, who has figured it in the "Botanical Register," considers it a charming perennial. The stems are trailing, and will extend two feet or more, seldom rising higher than a few inches above the ground. It flowers in profusion, and should be planted in a warm and very dry situation, otherwise the roots, being fleshy, are liable to become injured by wet. Increase is effected by seeds, sown in pots and planted in a cold frame.*

MYOSOTIS AZORICA, *Azorean Mouse-ear.*—This requires a loose peaty or sandy soil, and a damp, shady situation. It is increased by cuttings and seeds.

PLUMBAGO LARPENTÆ, *Lady Larpent's Lead-wort.*—For a figure and description of this fine border plant, which grows freely in any light soil, refer to "Mag. Bot.," v. xiv., t. 268.

SALVIA LINARIOIDES, *Linaria-like Sage.*—A very elegant species, growing about a foot high. The flowers are of a pale blue, but they are produced in succession during the whole of the summer and autumn. A light soil and warm situation is requisite. "Mag. Bot.," v. vii., t. 77.

SALVIA PRUNELLOIDES, *Prunella-like Sage.*—The stems of this pretty kind of Sage are produced closely, without appearing crowded, and rarely grow more than a few inches high. It will grow in any light soil and situation, and may be increased by cuttings. "Mag. Bot.," v. xi., t. 175.

SCUTELLARIA JAPONICA, *Japan Scull-cap.*—A pleasing little plant growing only four or five inches high, the habit is partly trailing, and it produces a profusion of showy blue flowers during the whole of the summer. It requires a light soil, and is increased by cuttings and division. "Mag. Bot.," v. x., t. 123.

TRIPTILION SPINOSUM, *Spiny Triptilion.*—The great point in growing this beautiful plant, is to preserve it from superfluous dampness. Plant it in a very light porous soil, and a dry situation. Increase is effected by seeds, which should be sown as soon as possible after being gathered, and the young plants kept in a warm house, until they are grown a good size. "Mag. Bot,," v. x., t. 269.

PENTSTEMON CRASSIFOLIUS, *Thick-leaved Pentstemon.*—This forms a low spreading shrub admirably adapted for planting in flower-beds. It grows about a foot high, and is a profuse flowerer during the whole of the summer and autumn; a light soil and open situation is the best. Propagation is effected by cuttings. "Mag. Bot.," v. ix., t. 198.

With Yellow Flowers.

STATICE FORTUNI, *Mr. Fortune's Statice.*—We are acquainted with this new addition to our flower-garden through Dr. Lindley, who described it in the "Hort. Jour.," v. i., p. 70. It is there stated to be well suited for bedding out, growing about a foot high. Sandy peat is the best soil in which to plant it.

---

* "Bot. Reg.," v. xxxii., t. 17.

With Red and Scarlet Flowers.

Phlox Leopoldiana, *King Leopold Lychnidea.*—This is a most beautiful hybrid raised from *P. Drummondii.* See "Mag. Bot.," v. xiv., t. 266.

Salvia oppositiflora, *Opposite-flowered Sago.*—The fine scarlet flowers are produced all through the summer. The stems are procumbent, and with the flower-spikes, reach about a foot high. "Mag. Bot.," v. xv., t. 53.

Silene Schafta, *The Schafta.*—This proves to be a beautiful little herbaceous plant growing about six inches high, and requiring a light sandy soil. It is increased by seeds, which are produced freely, but the young plants do not bloom until the second season.

Silene speciosa, *Showy Catchfly.*—A very brilliant flowering species, usually growing about a foot high. A dry, well-drained soil, and a warm situation are requisite. "Mag. Bot.," v. x., t. 220.

Stachys coccinea, *Scarlet-flowered Hedge Nettle.*—This is a native of Chili, and is about as hardy as Verbenas. It grows more than a foot high, and on this account is suited for beds of a large size. Increase is effected by cuttings. "Mag. Bot.," v. viii., t. 101.

CULTURE OF THE WAMPEE TREE (COOKIA PUNCTATA).

The Common Wampee of China and the Molucca Islands is the *Cookia punctata* of our botanical catalogues, and the *Quinaria Lansium* of "Lour. Coch.," 272, and "Rumph. Amboy.," v. i, t. 55.

In its wild state it forms a tree twenty feet or more high, with spreading branches. The *leaves* are pinnated; leaflets alternate, slightly unequal at the base, or oblique, ovate-lanceolate, acuminated. *Flowers* small, white, in racemose panicles. *Calyx* five-cleft. *Petals* five, navicular, villous. *Stamens* ten, with free, linear *filaments*, and roundish *anthers*. *Ovary* villous. *Fruit* baccate, somewhat globose, five-celled, cells one-seeded, about the size of a pigeon's egg, yellow on the outside. *Pulp* white, rather acid, but with a very pleasant sweetness.

The fruit is chiefly used in the desert; it is, however, scarcely known in Europe; but in China and the Indian Archipelago it is highly esteemed, and is sold in great abundance in the markets of Canton and other parts of China.

The tree is very productive, and its appearance highly ornamental, especially when covered with its numerous bunches of golden fruit, glittering in the vivid light of a clear tropical sun.

It was introduced to this country in 1795, and was cultivated for some years with great care; but as no fruit, or even flowers, were produced, it became ultimately neglected, and until within these few years past, it has been almost unknown to cultivators except by name.

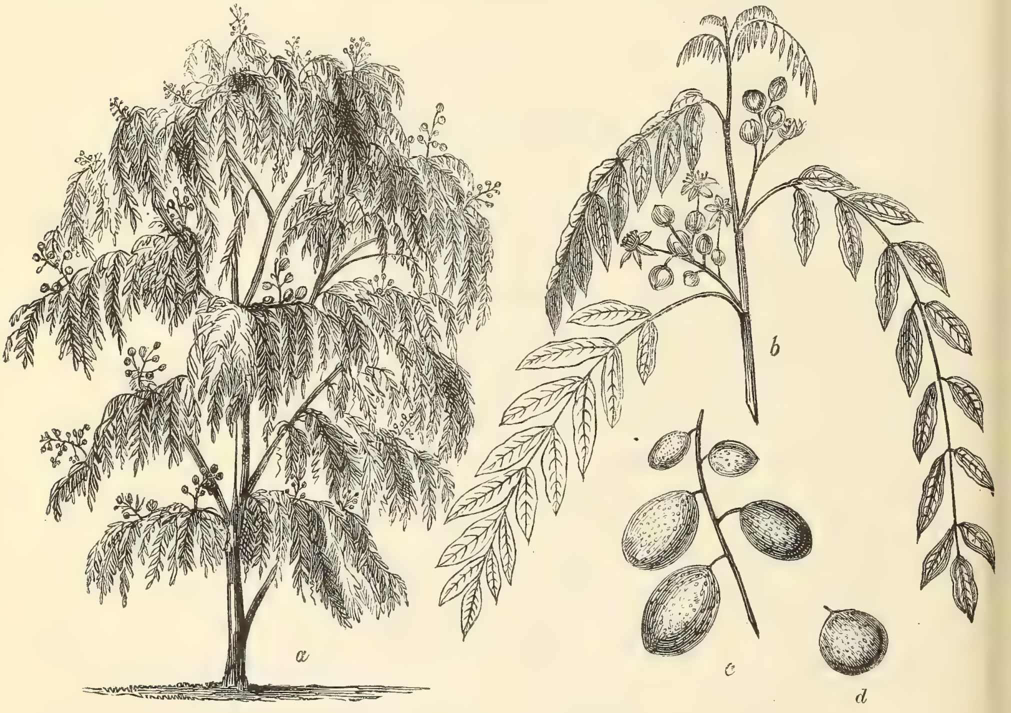
It is a stove plant, and associated by botanists with the Orange tribe (*Aurantiaceæ*). In temperature and general treatment, it may be classed with *Euphoria Litchi*, *Anona Cherimolia*, *Jambosa vulgaris*, *Spondias lutea*, &c., a moderate heat being most congenial to its habits and nature.

The soil, if the plant be grown in a pot or tub, should be composed of two parts good rich loam, one part peat, and one part very rotten horse-dung, with plenty of drainage ; but if it be turned out into a prepared border in the stove, a good rich turfy loam, without any other admixture, is all that is requisite.

The treatment in all other respects is that of common stove plants. Our specimen at Chatsworth, which is about nine feet high, is planted out at the south end of the large conservatory, at no great distance from the flue, where it can receive some little advantage from the heat to its roots.

Cuttings of the ripened wood, with their leaves unmutilated, will strike root, if planted in pots of sand plunged in heat under a hand-glass.

Two varieties are known, one bearing fruit somewhat of an oblong form, the other nearly globose.



DESCRIPTION OF THE WOODCUT.

a Plant of the Wampee Tree (*Cookia punctata*).
b Detached branch, showing the inflorescence.
c Part of a bunch of fruit of the oblong variety.
d A fruit of the globose variety.

FLORICULTURAL NOTICES.

NEW, RARE, AND INTERESTING PLANTS, IN FLOWER IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

Abronia umbellata. A beautiful little species, either for bedding or a trellis ; as we saw it growing, it looked remarkably well. The plant was set in the centre of a shallow pan, twelve or fourteen inches across, and as it grew, was wound round on the top of the soil, thus causing the foliage to cover the pot pretty evenly : from the axils of the leaves the flower-stems grew erect three or four inches, at the top of which the globular heads of reddish-lilac flowers were produced, and formed a very pretty object. The habit is evergreen, and the flowers sweetly fragrant. The plant will only require the same treatment as given to the *Verbena*, and is therefore a valuable acquisition to the ornamental classes of plants. It flowered for the first time in the gardens of the Horticultural Society, in August, and was introduced there by the Society's collector, Mr. Hartweg, from California.

Allamanda Schottii. A fine showy species, though not so rich in colour as *A. cathartica*, yet the flower is much larger, some measuring between six and eight inches across ; it differs, too, by having pale brownish stripes down the inside of the tube. The foliage is much handsomer and larger. The plant we noticed flowering in the nursery of Messrs. Henderson, Pine-apple Place, Edgware Road.

Calanthe vestita. This handsome species has flowered in the nursery of Messrs. Veitch and Son, Exeter, and proves not only the handsomest of its species, but rivals in beauty almost any of the tribe. The flower-scape was thirty inches long, densely laden with large pure white blossoms, enlivened with a deep spot of crimson in the throat. The stem and peduncles covered with long hairs. The foliage is about eighteen inches long, and of a pale green colour. This species differs from its race by having a smooth round bulb.

Echites Franciscea. A scarce Brazilian plant of great beauty, one of the tuberous-rooted species, with neat foliage of a bright green colour ; the flowers, from twenty to thirty in number, are fixed on a short stem growing from the axils of the leaves. The bloom is an inch-and-a-half in diameter, of a dark purple colour. The species is quite distinct from any of the race in cultivation, though not so attractive in colour. We noticed it among a collection of plants forwarded to the Horticultural Rooms in September last, by Mr. Iveson, gardener to the Dowager Duchess of Northumberland, Sion House, Middlesex.

Ericas, seedling var. Messrs. Veitch and Son exhibited in May last at the fête of the Royal Botanical Society, Regent's Park, several seedling varieties of *E. aristata*, possessing all the qualities of the parent in size and form, with the additional attraction of the colour being almost a scarlet. They likewise last much longer in bloom. The best was named *E. Devoniana ;* another, called *E. dulciflora*, was paler in colour, both richly deserving a place in every collection.

Gladiolus Brenchleyensis. We noticed a specimen of the above in the Horticultural Rooms, Regent Street ; it is a great improvement in colour to the varieties of *G. Gandensis*, and certainly the most striking and intense scarlet we could imagine. It is a hybrid variety, one of the parents being either *G. cardinalis* or *coccinea*, crossed with some of the larger growing kinds. The variety is well worthy the most extensive cultivation, and ought to be in every flower-garden.

Hoya Cunninghamii. A beautiful creeper, with neat foliage of rich green, producing clusters of yellowish-white flowers, about twenty in a bunch, each flower having a deep spot of purple at the base of the petals. They likewise have a delicious fragrance, which compensates for the absence of colour. Messrs. Veitch and Son are the introducers and cultivators of it, in whose nursery we noticed it flowering in September last.

Leschenaultia splendens. A fine and handsome specimen of the above we saw flowering in the gardens of Lady Antrobus, Cheam, Surrey. Another season will bring this admired species into more general cultivation. The brilliant colour of the flower entitles it deservedly to a place in every collection.

Nemophila maculata. In the Gardens of the Horticultural Society, Chiswick, this very pretty annual developed its blossoms for the first time in August last. It was introduced by the Society's collector, Mr. Hartweg, from California. The habit is rather coarse, and the foliage glaucous.

The flowers are about an inch and a half in diameter, well rounded petals; at the apex of each is a spot of deep violet on a ground of pure white. A most lovely flower, bears a minute inspection, and will deservedly become a rival to the handsome *N. insignis* with cultivators.

Pimelea Hendersonii. In the spring of this year we noticed a fine specimen of the above in the nursery of Messrs. Henderson, Pine-apple Place. At first sight, from the bright rose colour of the flower, it had much the appearance of *P. decussata*, but on closer examination we found the bloom larger and deeper in colour, the foliage much longer. The plant was two feet high, and about three feet in diameter, densely laden with bloom.

OPERATIONS FOR DECEMBER.

The weather having thus far been open and fine, operations in the open air have progressed without much interruption. Little remains to be done at this time of the year in the flower-garden, excepting the dressing of borders, trimming herbaceous and other plants whose tops have become shabby, rough-digging the ground, preparing soils, nursing any tender plants which may still remain out, and keeping the whole department in as neat order as the winter will allow.

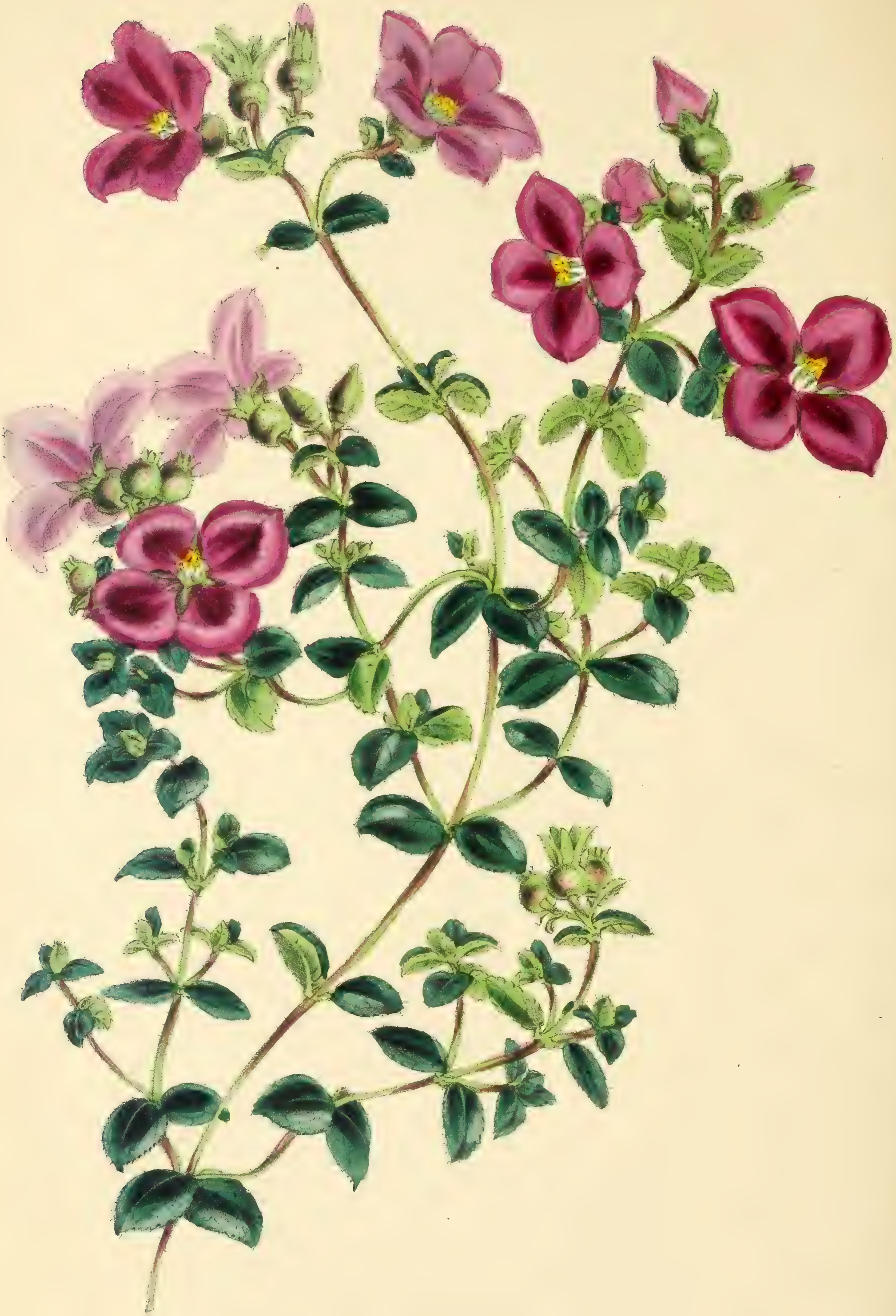
To cold pits and frames filled with young stock for next year's planting in the flower-garden, give as much air and light as the weather will permit, and no more moisture at the roots of the plants than is requisite to keep them from drooping; any overplus in this latter article will, at this season, endanger the well-being of the whole stock. It is always advisable to cover down safely every night with mats, that the plants may be rendered perfectly secure in case of frost.

In the conservatory and greenhouse many New Holland plants are now in full bloom, and render this department somewhat gay. Admit a free supply of pure air every day, and elevate the plants in bloom, so that they may receive the full benefit of all the light the season will supply. Give no fire-heat, except to keep away frost, as the greater part of greenhouse plants, and especially those from the Cape and New Holland, suffer much by its injudicious application.

In the forcing pits, regularly take in a quantity of Azaleas, Roses, Lilacs, Deutzias, and other plants it is desirable to bring early into flower. Keep them well watered, and let the atmosphere of the pits be very humid; and smoke with tobacco on the first appearance of aphis.

In the Orchid-house, Cattleyas, Lælias, several Dendrobes, and Orchids, with other species, are now in bloom, and will make a good display; these must be kept in an intermediate state, suited to the flowering season; that is, warm and partially dry; a few kinds are still in a state of vigorous growth, these must receive the usual requirements of growing plants, only in a less degree than during the hot season of summer; give them a lively heat, with moisture at the roots, and a somewhat humid atmosphere. The greater part of Orchids, however, are now at rest; use every means to make this as perfect as possible, that when the growing season commences, they may start with vigour, which they cannot do if subjected to excitement now. To attain this end withhold water from the roots, keep the atmosphere partially dry, admit a good circulation of air, and supply only a moderate fire-heat. If the above be attended to, the floors and stages of the house be kept clean, and the plants are not injured by direct draughts of frosty air, or the entrance of rain or snow, everything may be expected to terminate satisfactorily. Shade may also now be dispensed with altogether.

In the plant-stove, many winter-flowering species are now exhibiting their beauties, amongst which may be mentioned *Begonias*, *Ixoras*, *Euphorbias*, some species of *Gesnera*, and several other showy kinds of plants, which at this dreary season are valuable. Stove plants, however, are for the most part at rest, and should be kept at a temperature much lower than usual; also water more sparingly. Carefully avoid placing *Ixoras*, and other plants with similar habits, in situations where their roots will become dried with fire-heat; they always suffer from this, and not unfrequently perish. *Lagerstrœmias* and *Passifloras* should receive their winter pruning. If the house be kept clean, watering managed judiciously, and given in the early part of the day—a free circulation of air kept up, without cold draughts, and the plants kept free from dead leaves, few, if any, will be lost, and the whole may be expected, by their vigorous growth during the ensuing season, to repay the cultivator for all the attention now bestowed upon them.



Chætogastra strigosa.

CHÆTOGÁSTRA STRIGÒSA.

(Strigose Chætogastra.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
MELASTOMÀCEÆ.

(Melastomads, *Veg. King.*)

Generic Character. — Tube of *calyx* turbinate, pilose, or scaly; lobes five, permanent. *Petals* five, obovate. *Stamens* ten, with glabrous filaments, and oblong anthers. *Anthers* opening by one pore at the apex; having their connectives drawn out, sometimes into a simple or bifid spur, and sometimes into two small obtuse tubercles. *Ovary* free, bristly at the apex, and often denticulated. *Capsule* five-celled. *Seeds* cochleate.

Specific Character.—*Plant* a dwarf shrub, six or eight inches in height. *Branches* tetragonal, covered with adpressed bristles. *Leaves* small, entire, opposite, on short petioles, ovate, acute, three-nerved, somewhat ciliated, having on the upper surface a few scattered adpressed bristles, and on the nerves of the under surface scabrous. *Petioles* short, fleshy. *Flowers* axillary and terminal, cymose. *Cymes* pedunculate, few-flowered. *Calyx-tube* hispid, with five short, acute lobes. *Petals* four or five, rosy-purple, bractless. *Anthers* yellow, obtuse, scarcely auricled. *Ovary* five-celled. *Capsule* ovate.

Authorities and Synonymes.—Melastoma strigosa, *Lin. Fil. Sup.* 236; Melastoma ciliata, *Desr.* in *Lam. Dict.*, 4, p. 49; Osbeckia ornata, *Swartz, Flor. Ind. Occ.*, 647; Rhexia chamæcistus, *Sieb. Pl. Exsic. Mart.*, No. 297; Rhexia inconstans, *Vahl. Elc.*, 1, p. 37; Rhexia ornata, *Rich*, in *Bonp. Rhex.* t. 26; Rhexia strigosa, *Rich, Act. Soc. Hist. Nat.*, 1791, p. 108, Chætogastra strigosa, *De Candolle's Prod.*, 3, p. 131.

A new greenhouse plant, of considerable merit, introduced by Messrs. Veitch and Son, of Exeter, through their collector, Mr. Thomas Lobb. It is a native of Guadaloupe, where it was originally discovered, growing in beds of sphagnum on the summit of the Sulphur Mountain, and it has also been found on the mountains of Montserrat and Martinique.

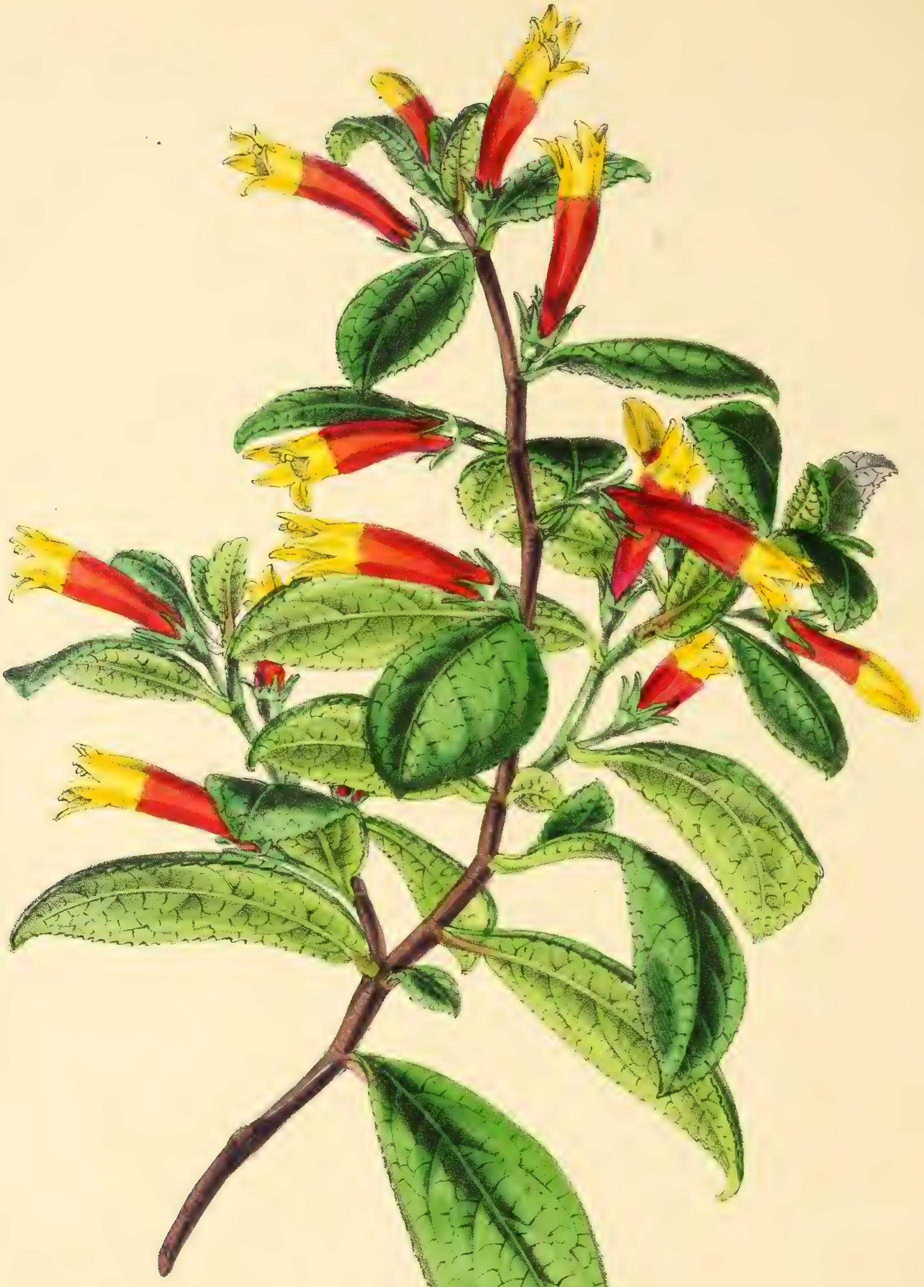
The habit of the plant is dwarf, leaves small, and branches slender and spreading, extreme height not exceeding six or eight inches, and the flowers, although not large, are produced in great abundance, and are of so rich a colour, that when expanded, the plant becomes a very conspicuous object.

More than thirty species of Chætogastra have been discovered and described, some of which are very handsome, but as yet few have appeared in our collections; and our present subject is perhaps the handsomest of any yet introduced.

They thrive best in a mixture of sandy peat and leaf-mould, with a small portion of loam, but the drainage must be complete. Propagation is effected by cuttings of the half-ripened wood, planted in either pots of soil or sand, and placed in a gentle bottom-heat under a glass. The young plants will flower when very small.

Our drawing was prepared in the nursery of Messrs. Veitch and Son, of Exeter, in August, 1848.

The generic name is derived from *chaite*, a bristle, and *gaster*, a belly; alluding to the tube of the calyx being beset with bristles or stiff hairs.



S. Holden, del & Lith.

Siphocampylus manettiaflorus

SIPHOCÁMPYLUS MANETTIÆFLÒRUS.

(Manettia-flowered Siphocampylus).

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
LOBELIÀCEÆ.

(Lobeliads, *Veg. King.*)

Generic Character.—*Calyx* adnate to the ovarium; limb five-parted, having the segments shorter than the tube of the corolla. *Corolla* irregular, tubular; tube entire, declinate, rather ventricose in the middle, and rather contracted at the base; limb five-parted, bilabiate; upper lip of two straight or spreading segments; the two lateral segments of the lower lip diverging, and the middle one more profound. *Stamens* and *anthers* combined, the latter bearded. *Capsule* ovate, two-celled, two-valved, dehiscing at the apex.—*Mag. Bot.*, v. xii., t. 173.

Specific Character.—A small, erect, firm growing *plant*, not exceeding a foot in height, suffruticose, leafy, branched. *Leaves* alternate, on short petioles or nearly sessile, from one and a-half to nearly two inches long, rather rigid, oblongo-ovate, obscurely serrated, reticulated, glabrous and glossy above, more rugose from reticulations, and somewhat hoary beneath. *Peduncles* from the axils of the leaves, short, not one-third as long as the leaf (together with the flower a little longer than the leaf), bearing two small bracts near the middle. *Calyx* a little downy; its *tube*, including the inferior ovary, turbinate; the segments erecto-patent, remotely serrated, subulate, one-fourth the length of the corolla. *Corolla* slightly curved, tubular for the greater part of its length, but singularly compressed laterally, two-coloured, red for two-thirds of its length from the base, the rest yellow. *Limb* with five segments, ovate-lanceolate, nearly equal, scarcely spreading, the cleft above scarcely deeper than between the rest of the segments. *Anthers* terminated by tufts of hair. *Stigma* two-lobed. *Stamens* and *style* included. *Hooker*, in *Bot. Mag.*, t. 4403.

This very handsome little shrub flowered beautifully in the nurseries of Messrs. Low, of Clapton, and Rollisson, of Tooting. In the latter our drawing was made in April, 1848.

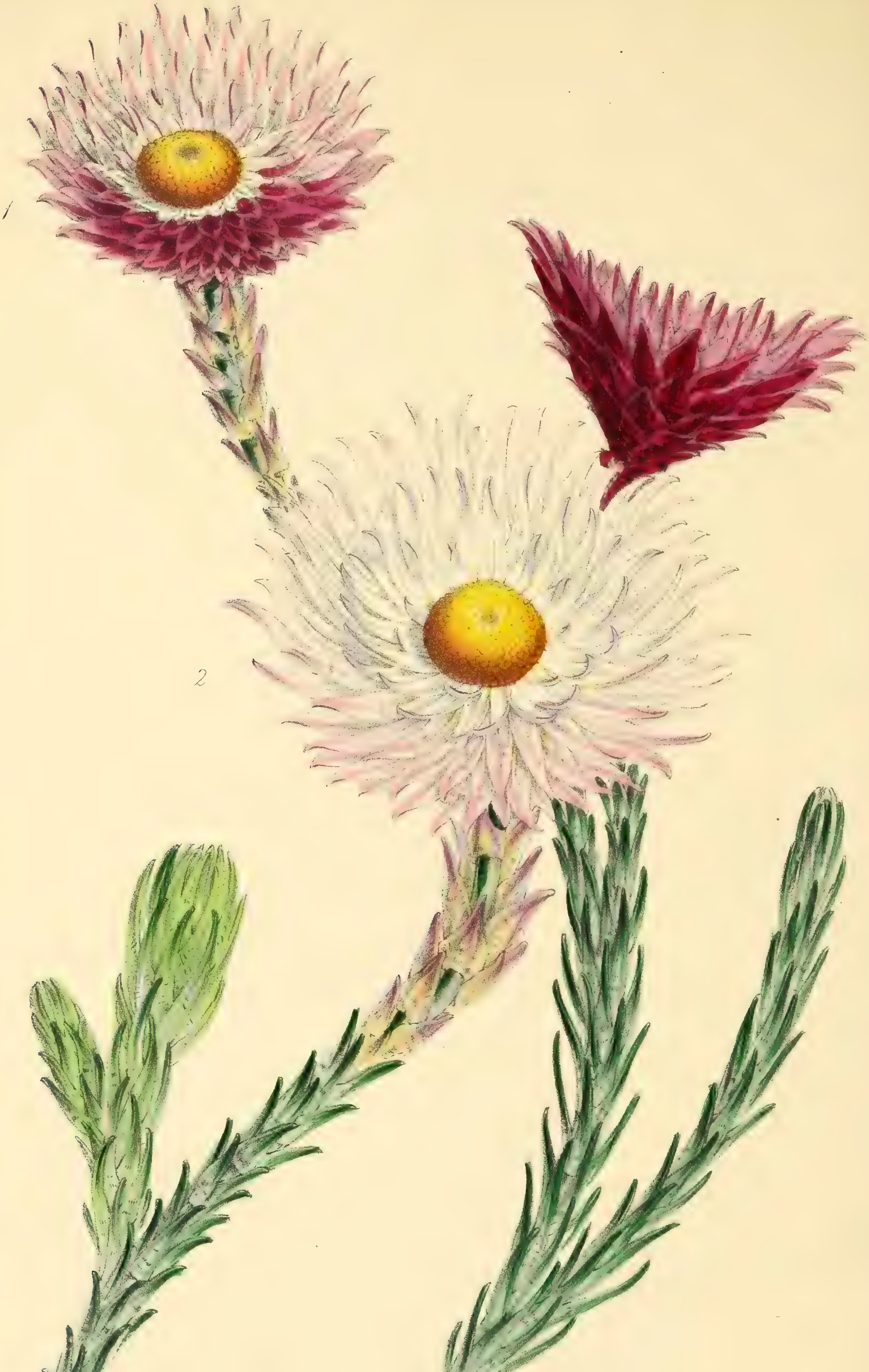
It is a stove plant with a dwarf, neat habit, and small deep-green foliage. The tube of the flower is of the brightest scarlet, and the divided limb of a rich yellow; the bloom being produced in great profusion. The plants when in flower are objects of great beauty.

It was originally introduced to this country from Belgium by Mr. Low, and is thought to be a native of New Grenada, but unfortunately few particulars can be gathered either as to its origin or introduction to Europe.

It is usually known in nurseries by the name of *S. nitidus;* but is in many respects a very different plant, with a much neater habit.

It thrives in a mixture of peat, loam, and sand, and requires to be kept moderately moist. Cuttings treated in the usual way for tender, soft-wooded plants, strike root with the greatest facility.

The generic name is derived from *siphon*, a tube, and *campylos*, a curve; in allusion to the curved tube of the corolla.



S.Holden, del, &Lith.

1 *Aphelexis humilis.*

2. *A. macrantha.*

APHELÉXIS HÙMILIS.

(Humble Aphelexis.)

Class.
SYNGENESIA.

Order.
SUPERFLUA.

Natural Order.
ASTERÀCEÆ.
(Composites, *Veg. King.*)

Generic Character.—*Capitulum* many-flowered. *Florets* of the ray female, arranged in several rows, each with a spreading limb. *Florets* of the disk hermaphrodite. *Receptacle* paleaceous. *Pappus* setaceous.

Specific Character.—*Plant* an evergreen shrub, about two feet in height. *Branches* numerous, slender, spreading, covered with a white tomentum. *Leaves* subulate, erect, imbricated. *Peduncles* scaly, single-flowered. *Flowers* rose-coloured.

This good old inhabitant of our greenhouses was introduced from the Cape of Good Hope, so long ago as 1810, and has always been a favourite amongst cultivators.

The beautiful flowers, which only expand during sunshine, are produced in great profusion in May and June, and are of a rich rose-colour. The habit of the plant is dwarf and spreading, and as the management is not difficult, it has for some years past, since cultivation has been well understood, held a place amongst first class subjects in all our Horticultural exhibitions.

Aphelexis Humilis macrantha, *Large-flowered Dwarf Aphelexis.*—This is a very striking variety of the above, which was raised from seeds a few years ago, and, with a similar habit, has larger and more conspicuous flowers.

The soil in which these plants grow best is sandy peat, and it is advisable in potting to elevate them a little in the centre of the pots. Good drainage, also, is indispensable, and a judicious supply of water, especially during the winter season, which should be rather scanty than otherwise.

Cuttings strike readily, planted in pots of sand, and placed under a glass in a moderately cool part of the propagating house, where they will not receive too much moisture.

Our drawing was made in the garden at Brookland Park, Blackheath, in May, 1846.

The generic name is derived from *apheles*, simple, and *exis*, habit; habit and construction of the plants.

PASSIFLÒRA NEUMÁNNII.

(Mr. Neumann's Passion-Flower.)

Class.
ONADELPHIA.

Order.
PENTANDRIA.

Natural Order.
PASSIFLORIÀCEÆ.
(Passion-flowers, *Veg. King.*)

Generic Character.—*Calyx* with a five-parted limb; tube short, having the throat ornamented with a filamentous crown. *Petals* five, or wanting. *Stamens* usually five, though sometimes with only four. *Ovary* pedicellate. *Berry* commonly pulpy, sometimes slightly membranous.

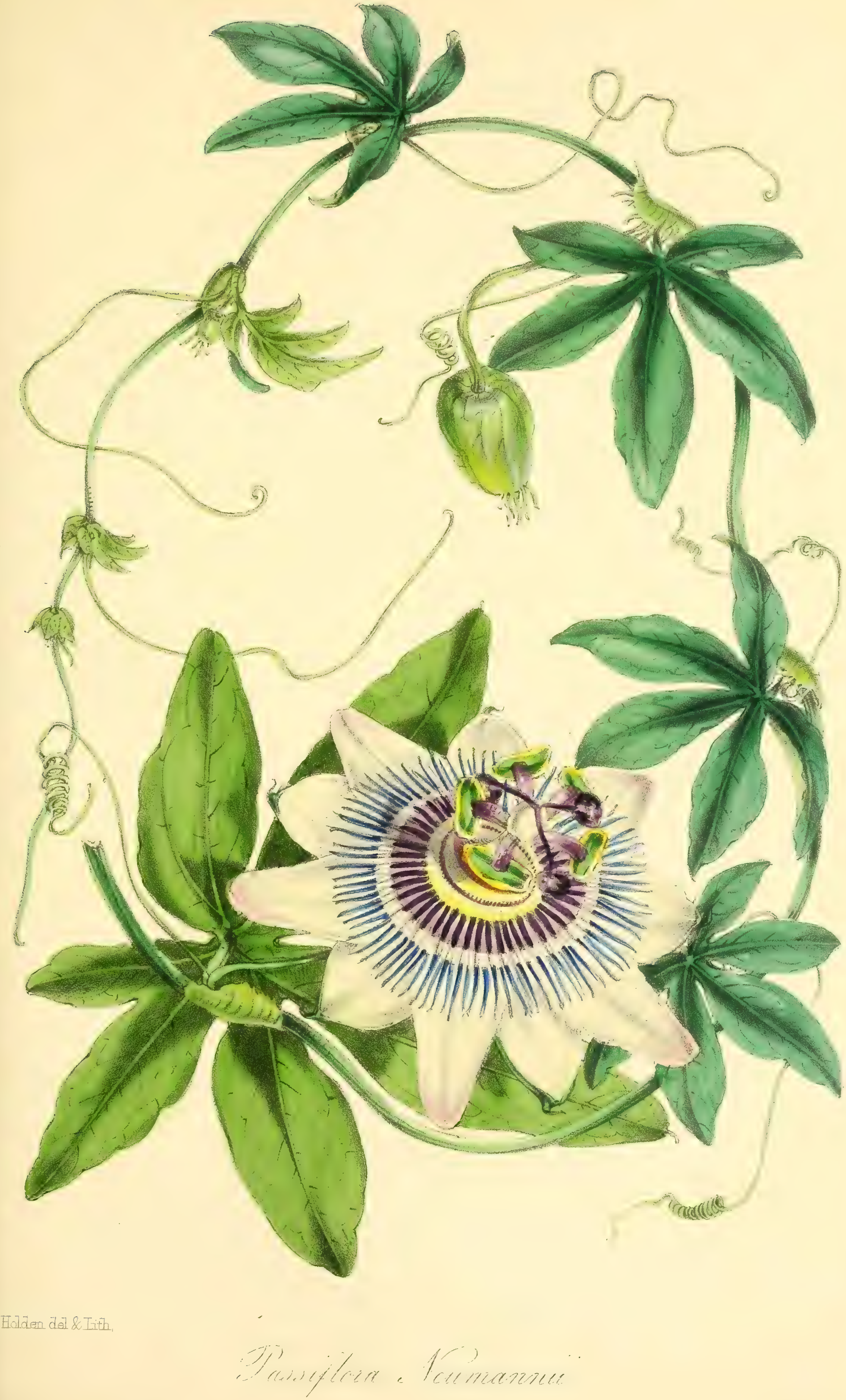
Garden Hybrid.—*Plant* an evergreen shrub. *Stem* climbing, tendrilled, slender, round, smooth. *Leaves* three-lobed; lobes slightly serrated, lateral ones narrowly ovate, middle one broader and larger, shining green above, glaucous beneath. *Bracts* leaf-like, pale green, broadly ovate, glandular. *Sepals* long, lanceolate, greenish white, having a long protuberal horn on the under side near the extremity. *Petals* shorter, narrower, somewhat thinner in texture, of a greenish white like the sepals. *Rays* of the crown cærulean blue, spreading. Filaments and styles greenish white.

A fine hybrid variety raised on the Continent, and named in honour of M. Neumann of the Jardin des Plantes, Paris. It will probably prove as hardy as *P. cærulea*, to which its flowers bear some resemblance in habit.

It bloomed profusely in the nursery of Messrs. Knight and Perry, King's Road, Chelsea; and our drawing was prepared in August, 1848.

It appears to produce flowers freely, each being suspended on a long slender peduncle; and the habit of the plant being very neat, will no doubt render this kind a favourite with cultivators.

It will thrive in any common light soil; but if grown in a pot, a mixture of sandy loam and peat is the best. Increase is effected by cuttings of the half-ripened wood, planted either in sand or soil, and placed in a gentle heat.



S. Holden del & Lith.

Passiflora Neumannii

FLORICULTURAL NOTICES.

NEW, RARE, AND INTERESTING PLANTS, IN FLOWER IN THE DIFFERENT SUBURBAN NURSERIES AND GARDENS.

ACHIMENES ATROSANGUINEA. A hybrid variety of great beauty, most probably allied to that section among which are *A. pedunculata* and *A. hirsuta,* the chief difference being the superb and brilliant scarlet colour of the flower. We likewise noticed another variety in the same section, called *A. vermillion,* which has bright orange-scarlet flowers, the size, shape, and manner of flowering, similar to *A. pedunculata;* both are very superior varieties. We saw them in flower in the nursery of Messrs. Knight and Perry, King's Road, Chelsea.

BROWALLIA SPECIOSA. A fine shrub for the conservatory, bearing large blueish-lilac flowers, star-shaped, an inch and a-half in diameter, pale yellow in the throat, produced rather scantily over the plant. The plant has a fine habit, with rich green foliage. We saw it in flower in September last, in the nursery of Messrs. Veitch and Son, Exeter, where we found

CALCEOLARIA SP. NOV., a remarkably fine shrubby species, growing nearly two feet high, headed by an immense mass of golden flowers; the bracts and calyx of the flowers large and ample, and partaking of the colour of the flower. The foliage, though large and coarse at the base, is thrown in the shade by the great profusion of the blossoms. For bedding out and forming a striking object in the border, we do not know a more useful plant than this.

DIPLADENIA CRASSINODA is deservedly the most admired of its race, from the neatness of habit and beauty of its blossoms, as well as for the profusion with which they are produced. Mr. Green, gardener to Lady Antrobus, of Cheam Park, has recently had it in fine condition of flower.

ERICA CERINTHOIDES CORONATA. A hybrid Heath of a brilliant red colour, approaching scarlet, very handsome, both in size of flower and for the profusion of the bloom. As an addition to the numerous seedling varieties, it will be most acceptable, as it will bear comparison with the best of the race. We found it flowering in the nursery of Messrs. Rollisson, Tooting.

GLOXINIA CARMINATA SPLENDENS. A fine richly coloured flower, with great beauty of form and substance of petal, has been forwarded to us by Messrs. Backhouse, of York. To the very numerous hybrid varieties of this handsome tribe, the above-named will give an additional and attractive feature.

IMPATIENS REPENS. This pretty and distinct Balsam was introduced some time since from Ceylon, by Messrs. Low, Clapton. Its flowers are a rich yellow colour, about an inch long, with small heart-shaped foliage of a bronzy green, the stem reddish. We noticed it in flower in a small pan, hanging several inches down the sides, studded with its blossoms, in the nursery of Mr. Jackson, Kingston.

Miltonia Karwinskii. This remarkable species has recently exhibited its flowers in the gardens of the Horticultural Society, Chiswick, where it was introduced by the Society's collector, Mr. Hartweg. The flower-scape was branched, and nearly four feet long, covered with gaily coloured blossoms. The flower is about an inch and a-half long ; the sepals and petals greenish, richly spotted with dark brown ; lip deep lilac colour on the upper half. The foliage large and handsome, of a bright green colour.

Phalœnopsis grandiflora. The large-flowered kind of Phalœnopsis, a fine specimen of which has lately flowered in the gardens of S. Rucker, Esq., Wandsworth. The flower-scape was about two feet long, branched, and held upwards of thirty of its immense blooms well developed. The purity of the white, and delicate marking of yellow on the labellum, added to the freedom and profusion of its bloom, makes the species deservedly the most admired with the cultivators of Orchidaceæ.

GENERAL INDEX.

A.

Abelia rupestris, xiii. 43, 214, xv. 208; floribunda, xiv, 188, 238, 248, xv. 142

Abies, a shallow sandy soil desirable for the species of, vii. 65

Abronia umbellata, xv. 263

Abscission, propagation of oranges by, i. 92

Absorption, process of, explained, v. 86, xv. 13

Abutilon striatum, vi, 236, vii. 53; culture of, vii. 54; almost hardy, vii. 54; Bedfordianum, viii. 211; vitifolium, xi. 260; pæoniæflorum, xii. 163; *graveolens*, xii. 21; venosum, xiii. 189; *vitifolium*, xiii. 116

Acacia prensans, ii. 112; vestita, iii. 145; 192; longifolia, pulchella, with a select list of desirable species, iv. 197, 198; pubescens, iv. 71; cultrata, vi. 259; kermesina, vi. 236; oxycedrus, vii. 44, 151; treatment of, vii. 152; pulchella, *var.* magna, vii. 91; biflora, viii. 44, ix. 221; culture of, ix. 222; diptera, *var.* erioptera, ix. 92; platyptera, ix. 70; pulchella, *var.* magna, ix. 46; urophylla, ix. 94; dentifera, x. 186; rotundifolia, x. 212; spectabilis, x. 212; cultriformis, xi. 123; directions for the cultivation of, xi. 124; new species of, xi. 69; longifolia, xii. 269; celastrifolia, xiv. 139; linifolia, xiv. 238; mœsta, xiv. 19; squamata, xiv. 47; argyrophylla, xv. 164, 256; celastrifolia, xv. 256; cultriformis, xv. 256; integerrima, xv. 119; leptoneura, xv. 256; longifolia, xv. 256; oncinophylla, xv. 256; rotundifolia, xv. 94, 123, 256; dodonœifolia, xv. 46; ixiophylla, xv. 189

Acanthophippium bicolor, ii. 153; striatum, vii. 44; sylhetense, vii. 44; javanense, xii. 22; javanicum, xiii, 211; *javense*, xiii. 211

Acarus telarius, xiv. 95; means for destroying, v. 71

Acclimatation, plausibility of the theory of, vii. 136; facts demonstrative of its possibility, vii. 136; of exotics, limited application of the term, viii. 60; hints for the effectuation of the, vi. 61, 108, 110, 156, 184, 206, viii. 13, 37, 60, xiv. 33

Accretions of plants, character and source of the, vi. 58, 85

Aceras, ii. 108; anthropophra, xv. 32

Achania mollis, propagation of, iii. 47

Achemius coccinea, iii. 14

Achimenes longiflora, viii. 213, ix. 92, 151, 166; management of, ix. 152; rosea, viii. 213; ix. 20, 166; pedunculata, ix. 142; grandiflora, x. 23, 117, 145; how to cultivate, x. 146; hirsuta, x. 259; multiflora, x. 166, 223; treatment requisite for, x. 224; pedunculata, x. 262, 271; management of, x. 272; on growing, xi. 204; propriety of staking, xi. 205; on suspending in baskets, xi. 205; as border plants, xi. 207; pedunculata, xi. 68; picta, xi. 188; grandiflora, xii. 43; argyrostigma, xii. 188, 190; hairy, xii. 7; the painted, xii. 223; hirsuta, xii. 7; its accidental discovery, xii. 7; picta, xii. 18, 223; the most successful cultivation of, xii. 224; to have in flower at any season, xiii. 224; atrosanguinea, xiii. 189; formosa, xiii. 237; Liepmannii, xiii. 165; longiflora, *var.*, xiii. 117; patens, xiii. 141, 197; the best period for the flowering of, xii. 198; spreading, xiii. 197; coccinea grandiflora, xiv. 214; coccinea ignea, xiv. 214; coccinea intermedia, xiv. 214; coccinea superba, xiv. 214; cupreata, xiv. 117, 164; patens variety, xiv. 142; pyropæa, xiv. 238; Skinneri, xiv. 238; venusta, xiv. 214; Kleii, xv. 216; venusta, xv. 121; superba, xv. 121; grandiflora ignea, xv. 121; intermedia, xv. 121; rosea major, xv. 121; candida, xv. 239; *spe. nov.*, xv. 22; ocellata, xv. 94; longiflora macrantha, xv. 239

Achras sapota, xv. 107

Acids, vegetable, xi. 157

Acineta Barkeri, xiv. 145

Acis, ii. 70

Acmadenia, xiv. 227

Aconitum versicolor, iv. 191; chinense, iv. 213, v. 3; autumnale, xiv. 64, 139, 262

A consideration of plants grown in pots, xiii. 37

Acorus Calamus, xv. 248

Acronychia Cunninghami, x. 46

Acrophyllum venosum, x. 166; verticillatum, x. 260; venosum, viii. 165

Activity, when necessary in performing out-door operations, xiii. 47

Aculei or other sharp points, probably the conductors of electrical fluid, vii. 180

Adenandra, ii. 24, 48, xiv. 227

Adenanthera pavonina, xv. 110

Adenium Honghel, xiii. 235

Adenocalymna comosum, xiii. 43

Adesma pendula, iii. 70

Advantages of striking cuttings in water, iv. 180

Æchmea fulgens, x. 173, xii. 190; plan for treating, x. 174; discolor, xi. 212, xiv. 91, 164

Ægiphila, ii. 107, 110; grandiflora, xiii. 115, 217

Ænothera humifusa, iii. 69

Æolian Cytisus, iv. 16

Æonium cruentum, viii. 259; Youngianum, xi. 164

Æschynanthus grandiflorus, culture and habits of, v. 241; ramosissimus, vi. 195; treatment of, vi. 196; Roxburghii, vi. 213; grandiflorus, vii. 213; ramosissimus, excellent plan for flowering, vii. 16; on suspending the species of, in stoves, ix. 135 suitableness of leaf-mould for the species of, x. 136; maculatus, xi. 69; xiii. 165; *albida*, xiii. 139; Boschianus, xiii. 165, 175; where to grow, xiii. 176; Horsfieldii, xiii. 189; Lobbianus, xiii. 235; miniatus, xiii. 262; pulcher, xiii. 141, 162: purpurascens, xiii. 139; radicans, xiii. 214; Vanden Bosch's, xiii. 175; longiflorus, xiv. 141, 190, 238, xv.

25 ; miniatus, xiv. 262 ; speciosus, xiv. 188, 199.
Æsculus, ii. 225 ; fœtens, iii. 44 ; propagation of, iii. 72 ; hippocastanum, an excellent subject for botanical examination, vi. 180
Æstivation, application of the phrase, vii. 163
Aeranthus grandiflora, ii. 132
Aerial system of forcing, xiv. 154, 253
Aerides, culture of the genus, i. 15 ; cornuta, ii. 132 ; odorata (cornuta), fine flowering plant of, iv. 118 ; quinquevulnerum, vi. 187, 260 ; tessellatum, vi. 139 ; supposed new species of, vi. 260 ; affine, vii. 141 ; quinquevulnerum, viii. 241 ; treatment of, viii. 242 ; Brookii, ix. 145, 238 ; its treatment, ix. 146 ; crispum, ix. 238 ; quinquevulnerum, ix. 214 ; affine, x. 167, 260 ; maculosum, xi. 141 ; virens, 187 ; —— ? xii. 165 ; odoratum, xii. 43 ; maculosum, xii. 49 ; the most preferable method of growing, xii. 50 ; great-flowered, xiii. 217 ; *ampullaceum*, xiii. 49 ; new species, xiv. 141 ; odorata, xiv. 142 ; virens, xiv. 93, 197
African Box Thorn, iii. 71
Agallochum, xv. 43
Agalmyla staminea, xiv. 272, xv. 73, 190
Aganisia pulchella, vii. 139, 142, xi. 212, xv. 190
Agapanthus umbellatus, culture of, ix. 65 ; *var.* maximus, x. 47
Agathosma, xiv. 227
Agave americana, iii. 120, v. 135 ; saponaria, vi. 235
Age of plants, iii. 113
Agency of solar light, xv. 57
Agila Wood, xv. 44
Aginetia longiflora, xiii. 93
Agnostus sinuata, xiii. 213, xiv. 1
Agrostemma Bungeana, iii. 45, iv. 7
Air, directions for admitting it into plant-houses, v. 96, 168, 192, 216, 240 ; remarks on its admission to plant-houses, vi. 96, 143, 167, 240, 263 ; importance of diluting the water supplied to plants with, 12 ; constituents of atmospheric, viii. 84, 105, 201 ; its influence on vegetation, viii. 201 ; experiments of Mr. Ward on its slight value to certain plants, viii. 203
Air-plant, five-blotched, viii. 241 ; Sir W. Brooks's, ix. 145 ; spotted, xii. 49 ; dark-green leaved, xiv. 93, 197
Air-tight cases for containing plants, those of Mr. Ward described, viii. 203
Aitkin, Dr., on Absorption, xv. 13
Akebia quinata, xiv. 115
Akee Tree, culture of, iv. 60
Albumen, its nature, vii. 259 ; nature and components of, xi. 154
Alburnum, derivation and meaning of the term, vi. 57
Alder Tree, goat moth injurious to, i. 48
Alders best adapted for placing near water, viii. 162
Aletris punicea, xii. 91
Alhenna, xv. 213
Alkalies, the great source of nutriment to plants, viii. 154
Alkanet, xv. 259
Allamanda cathartica, good method of increasing, iii. 168 ; best system of cultivating, viii. 77, 78 ; grandiflora, xi. 236 ; large-flowered, xii. 79 ; grandiflora, xii. 79 ; how to manage, xii. 80 ; cathartica, xiv. 88, 105, 142 ; grandiflora, xiv. 89, 105 ; Schottii, xv. 263
Alligator Apple, xv. 137
Allium siculum, iii. 263 ; cæruleum, vii. 210
Alloplectus dichrous, xiii. 68 ; repens, xiii. 187 ; *Schotii*, xiii. 68 ; *sparsiflorus*, xiii. 68 ; concolor, xv. 141
Almeidea, xiv. 223
Almug Tree, xv. 109
Aloes, watering of, iii. 47 ; hints on, iv. 24 ; entire management of the genus and its allies, vii. 251
Aloe-leaved Yucca, iii. 25
Aloe Wood, xv. 43
Alona cœlestis, xi. 210, see *Nolana;* cærulean-flowered, xii. 3 ; cœlestis, xii. 3 ; useful as a flower-garden plant, xii. 4 ; attention to moisture for, necessary, xii. 4, xv. 258
Alonsoa acutifolia, iii. 120, iv. 24
Aloysia citriodora, culture out of doors, i. 157
Alphabet of Botany noticed, ii. 94
Alpine plants, natural habits of, v. 230 ; culture of, v. 230 ; highly deserving of attention, vii. 5 ; their culture recently revived, vii. 5
Alpinia nutans, xiii. 125 ; where to plant, xiii. 125 ; nodding-flowered, xiii. 125
Alsenosmia, xiv. 249
Alstrœmeria pelegrina alba, i. 192 ; culture of the genus, i. 199, ii. 205, 264, 270 ; potting of, iii. 47, iv. 157 ; Ligtu, vi. 68 ; brief hints on the treatment of, vi. 68 ; sorts that will thrive in an exposed plot, viii. 87 ; nemorosa, ix. 189 ; lineatiflora, x. 260 ; *montana*, xiii. 151
Alterations in the Gardens, the best time for, ii. 240 ; proper period for determining the effect of, vii. 190
Althæa frutex, ii. 3
Altingia excelsa, hints on the management of, iv. 207
Alumina or clay, its power of retaining water, vii. 10 ; its nature and properties, xi. 228
Alyssum orientale, *var.* variegatum, viii. 94
Amancaes, Mr. M‘Lean's, v. 210
Amaryllis formosissima, i. 149 ; Kermesina, i. 12, iv. 24 ; preparations for forcing, v. 216 ; Banksiana, ix. 45 ; japonica, ix. 166 ; hints on the treatment of the genus, ix. 45 ; *montana*, xii. 20 ; *tatarica*, xii. 20 ; *montana*, xiii. 151 ; *tatarica*, xiii. 151 ; *spe. nov.* xv. 214
Amaryllideæ, remarks on some plants belonging to the order, ii. 68 ; culture of, iii. 21
Amelanchier, ii. 225
Amentum, application of the term, vii. 161
America, notes of the Forests of, ii. 165
American aloe, suggestions for flowering the, v. 135 ; cowslip, entire-leaved, v. 16 ; plants, heath-soil not essential to, viii. 39
Amicia zygomeris, x. 91 ; two-jointed-podded, xiii. 173 ; zygomeris, xiii. 173 ; remarkable feature of, xiii. 173
Ammonia, viii. 129 ; its presence in rain-water, viii. 178 ; useful in softening water, viii. 179, xv. 203
Ampelopsis, notice of the culture of, ii. 114
Amphicome arguta, v. 90, 189, vi. 80, xv. 234
Amomum vitellinum, xiv. 213
Amygdalus persica, xv. 189
Amylum, deposited in the cells of plants, xi. 105 ; sugar prepared from, xi. 154
Amyris Guileadensis, xv. 70 ; Kataf, xv. 140
Anæctochilus setaceus, x. 188, v. 16, xi. 261
Anagallis Webbiana, ii. 114 ; Phillipsii, Monelli, iv. 157
Analysis of soils, vii. 9, 57, 105 ; its definition and modes, viii. 33
Analysis, the utility of, xi. 177
Anatherium nardus, xv. 237 ; muricata, xv. 237
Anchusa versicolor, iii. 94 ; petiolata, viii. 67, xv. 259 ; canescens, xv. 151 ; virginiana, xv. 151
Andromeda, origin of the name, i. 164 ; culture of the species, i. 165, ii. 120, 225 ; propagation of, iii. 47 ; floribunda, its hardihood, v. 94 ; tetragona, viii. 94 ; phyllireæfolia, xi. 164 ; *coccinea*, xii. 101
Andropogon calamus aromaticus, xv. 238 ; Schænanthus, xv. 238

Androsace-like Leptosiphon, iii. 142, 219
Androsace lanuginosa, x. 67, xiv. 50
Anemone hortensis, ii. 16 ; coronaria, ii. 17 ; history of, ii. 16 ; herbaceous species, ii. 16 ; propagation, ii. 16 ; general notices of treatment, ii. 24, 48, 72, 88, 119, 144, 167, 192, 216, 240, 264, iii. 216 ; rivularis, ix. 45 ; *Goveniana*, xii. 18 ; single scarlet flowering, for flower beds, xi. 182 ; planting, v. 24, 48 ; Japonica, xiii. 20, xiv. 25, xv. 21, 233 ; hybrida, xv. 239 ; obtusiloba, xii. 18
Angelonia salicariæfolia, natural habits of, v. 75 ; culture of, v. 76 ; Gardneri, vi. 234 ; speciosa, vii. 213 ; cornigera, viii. 18 ; angustifolia, xv. 164, 189 ; moschata, xv. 214
Angle of inclination, French method of estimating, ii. 257 ; English do. ii. 258
Angophora cordifolia, xiv. 41 ; lanceolata, xiv. 41
Angræcum eburneum, i. 258 ; distichum, ii. 211 ; caudatum, iii. 119 ; odoratissimum, iv. 95 ; caudatum, iv. 132 ; gladiifolium, v. 188 ; armeniacum, vi. 213 ; caudatum, vi. 188 ; bilobum, vii. 187, 236 ; pertusum, vii. 237 ; bilobum, x. 188 ; caudatum, x. 188 ; armeniacum, xi. 189 ; pellucidum, xi. 20 ; bilobum, xii. 45 ; distichum, xii. 69 ; apiculatum, xii. 115 ; *eburneum*, xii. 69 ; funale, xiv. 91 ; caudatum, xv. 141
Anguloa superba, ii. 132 ; uniflora, xi. 166, 261 ; new species of, xi. 117, 166 ; uniflora, xii. 141 ; Clowesii, xii. 18 ; *superba*, xii. 117 ; grandiflora, xii. 117 ; Ruckeri, xiii. 187 ; spes., xiii. 141 ; Clowesii variety, xiv. 164
Ania bicornis, xi. 42
Anigozanthos, perhaps rufa, iv. 212 ; coccineus, v. 271 ; flavidus, *var.* bicolor, vi. 19 ; Manglesii, vi. 139 ; humilis, vii. 43 ; fuliginosus, xiv. 91
Animal life, its connection with that of vegetables, viii. 106
Anise-seed tree, Florida, v. 147
Anneslea tomentosa, v. 259
Annuals, culture of the hardy kinds, i. 18 ; half-hardy, i. 19 ; tender, i. 20 ; selection of choice ones, i. 22 ; ii. 192, iii. 23, 48, 72, 96, 144, 168, iv. 96, 120, 192 ; half-hardy, to be sown, iv. 72, v. 24, 48, 96, 120, 144, 168, 192, vi. 48 ; climates which they usually inhabit, vi. 62 ; vii. 48, 192, 216 ; those designed for the beds of the flower-garden during summer should be sown in pots, vii. 119 ; propriety of hybridizing, vii. 143 ; hints on their germination, vii. 144 ; advisability of sowing a few of the hardiest sorts in some of the flower-garden beds in autumn, vii. 192 ; viii. 24 ; plan of flowering them in spring in the open ground, viii. 181 ; many of the Californian, hardy, viii. 180 ; x. 47, 72 ; how to get an early display of, x. 192 ; xiii. 61 ; usefulness of, 61 ; conditions unfavourable to the welfare, xiii. 61
Anomatheca cruenta, i. 103 ; ii. 24, 48, 103, 264 ; planting roots of, v. 48
Anona palustris, xiii. 92 ; *aquatica*, xiii. 92 ; *glabra*, xiii. 92 ; *uliginosa*, xiii. 92 ; Cherimolia, xv. 132 ; tripetala, muricata, squamosa, reticulata, palustris, punctata, longifolia, senegalensis, cinerea, paludosa, glabra, sylvatica, xv. 132
Anopteris glandulosus, xv. 141
Ansellia africana, xiii. 241 ; africana, xiii. 70, 139, 241 ; the treatment it flourishes under, xiii. 241, xiv. 47
Antennaria triplinervis, vi. 20
Anthericum glaucum, iv. 234 ; cæruleum, xiii. 117
Anthers, ordinary form of, vii. 233
Anthrocercis viscosa, beneficial effects produced on, by planting out, v. 214 ; ilicifolia, xiii. 20
Antirrhinum glandulosum, iii. 261 ; caryophylloides, iv. 165, v. 55, xv. 233 ; trionithophorum, v. 235 ; majus, variegated variety of, viii. 165 ; majus flore pleno, ix. 166 ; majus, *var.* quadricolor, x. 197 ; best way of treating, x. 198 ; majus flore pleno, xi. 99, 100 ; xv. 233 ; majus, *var.* Youngiana, xiii. 271, xv. 233
Antler moth, ii. 215
Aotus ericoides, culture of, v. 51 ; gracillimus, xii. 69, xv. 256
Apetalæ, distinguishing feature of, vii. 231
Aphelandra cristata, v. 236, vii. 173, 174 ; aurantiaca, xi. 273 ; cristata, xi. 236 ; orange-scarlet, xii. 127 ; aurantiaca, xii. 127, 128 ; ——? xiii. 70 ; aurantiaca, xiii. 92 ; xiv. 29 ; Ghiesbreghtiana, xv. 176
Aphelexis humilis, xv. 251 ; macrantha, xv. 251
Aphides, xiv. 70 ; prevalent in 1846, xiv. 176 ; cassiæ, xiv. 95 ;
Apios tuberosa, xiv. 214
Apocyneæ, culture of, i. 97
Aporem anceps, i. 156 ; iv. 235 ; indivisum, iv. 236
Apple tribe, ii. 208
Appleby, Mr., on propagating by layers in pots, i. 92
Application of heat, xiii. 9, 81
Approach of spring, xiv. 40
Apricot, coloured Epidendrum, iii. 167
Aquatic Plants, treatment of, i. 41 ; ii. 65 ; a selection of, iv. 107 ; aquariums, viii. 111, 112
Aquilaria Agallochum, xv. 43, 113
Aquilegia glauca, vii. 184, ix. 20 ; glandulosa, x. 119 ; Skinneri, x. 119, 199, 200 ; jucunda, xiv. 92 ; leptoceras, xiv. 272 ; jucunda, xv. 232 ; Skinneri, xv. 233
Aralia japonica, a handsome ornament to lawns, viii. 229
Araucaria, ii. 212
Arboretum et Fruticetum Britannicum, review of Loudon's, vi. 64, vii. 134 ; definition and merits of, vi. 81, viii. 41 ; objections to, ix. 180
Arbours, xiii. 167
Arbutus, i. 168 ; procera, ii. 147 ; new species of, viii. 94 ; tomentosa, viii. 94
Architecture, viii. 107, 183, 231, 255 ; importance of a knowledge of it to the gardener, viii. 111 ; beauty in plant-houses, viii. 108
Arctostaphyllos, ii. 92 ; tomentosa, ii. 260 ; viii. 259 ; pungens, ix. 45, xi. 68 ; nitida, xii. 140
Ardisia, iii. 72 ; odontophylla, iii. 260
Arenaria rubra, its presence and indication of sand, iv. 9
Arethusa bulbosa, ii. 152
Argyreia, ii. 108
Argyrotosa Bergmanniana, xiv. 72
Aridity, in the winter treatment of plants, vi. 240, 263, vii. 47, 216, 240, 264 ; its indispensability to succulents at certain periods, vii. 180, 208, 228
Arid heat, its disagreeableness to man and injuriousness to vegetation, vii. 120
Ariopsis peltata, xiii. 92
Arisæma Murrayana, xv. 189
Aristolochia Clematitis, i. 63, ii. 37 ; trilobata, iii. 2 ; hyperborea, v. 187 ; saccata, v. 65 ; ciliata, vi. 234 ; ciliare, vii. 116 ; hyperborea, vi. 54, ix. 214 ; gigas, ix. 261, xi. 93 ; ornithocephala, xi. 261 ; gigantea, xiii. 92 ; grandiflora, xv. 117, 141 ; anguicida, xv. 94
Armeria cephalotes, xii. 18 ; *latifolia*, xii. 18
Aromatic maxillaria, iii. 168
Arpophyllum giganteum, xv. 142
Arrangement of plants in conservatories, ix. 13
Artemisia Judaica, xv. 253
Arthrostemma versicolor, v. 209 ; fragile, xv. 117

Artificial manures, xi. 109
Artocarpus integrifolia, iii. 244
Arum, new species, xiv. 68
Arundina densa, ix. 164; bambusifolia, xi. 237; densa, xii. 22
Asarum japonicum, v. 93; europæum, xi. 256
Asclepiadeæ, ii. 261, iii. 46; serpentaria, iii. 2; tuberosa, ii. 26, 48; vestita, xi. 187
Aspasia variegata, iv. 19; epidendroides, v. 163; variegata, v. 140; epidendroides, ix. 47, 189; new species of, ix. 214; lunata, xiv. 142
Aspidiotus Nerii, xiv. 95; proteus, xiv. 95
Astelma eximium, v. 104, xiv. 41
Aster argophyllus, iii. 23; bicolor, xii. 262
Astiria rosea, xi. 210
Astrapæa, remarks on the genus, iii. 67
Asystasia coromandeliana, xiii. 187; xiv. 125
Ataxia Horsfieldii, xv. 237
Atelandra incana, vii. 43
Atmospheric moisture, vii. 82
Atragene, ii. 35; japonica, xiv. 5
Aucuba Japonica, iii. 23; xi. 254; xiii. 94; xiv. 33
Auricula, i. 9, 12, ii. 48, 72, 96; Page's Waterloo, iii. 93; Taylor's Glory, iii. 166; Stocks, Mignonette, &c., iii. 216; v. 24, 72
Australian Orchidaceæ, vii. 43
Author of Domestic Gardener's Manual, on the Genus Gloxinia, ii. 76
Autumn, tender plants in, vi. 239, 263; Mandrake, iii. 93; on plants to flower late in, xiii. 112
Avenues of trees, where suitable, ix. 160
Averrhoa Carambola and Bilimbi, xv. 229
Aviaries for small birds, a word on, ii. 236
Azalea Danielsiana, i. 129; pulchra, i. 126; culture, i. 126, 127; marginata, ii. 121; indica Smithii, ii. 145; indicum speciosum, ii. 78; sinensis coccinea, ii. 121; nudiflora eximia, ii. 163, 88, 119, 225; greenhouse kinds for forcing, iii. 23; Rawsonii, iii. 123; indica, variegated, iv. 44, 94; indica Smithii, iv. 94; propagation, iv. 144; indica, iv. 69; Danielsii, v. 117; littoræa, v. 140; indica Smithii, v. 67, 91; indica variegata, v. 119; watering freely, v. 72; forcing, v. 216, propagation, v. 142; grafting, v. 142; vii. 156; variegata, vii. 175, 176; Gledstanesii, viii. 165; splendens, viii. 94; altaclarensis, ix. 115; speciosissima, x. 119; seedling, x. 94; xi. 160; new varieties of, xi. 117; seedling Chinese, xii. 55; exquisita, xii. 55; optima, xii. 55; Broughtonii, xii. 55; Lætitiæ, xii. 212; Ludovicæ, xii. 260; alba magniflora, xiii. 70; obtusa, xiii. 163; violacea elegans, xiii. 70; xiv. 47; Chinese, xiv. 59; Fielder's white, xiv. 117; Indian, xiv. 59; selection of, xiv. 63; squamata, xiv. 64; training and pruning, xiv. 136; obtusa, xv. 209; ovata, xv. 210; Rawsonii, xv. 209; squamata, xv. 210
Azote, its nature, ix. 178

B.

Balm of Guilead, xv. 68
Balsamina hortensis, iii. 228
Balsam, hints on the common garden, iii. 120, 228; treatment of, v. 120
Balsamodendron africanum, xv. 93; guileadensis, xv. 69, 140; Myrrha, xv. 94, 140; Kafal, xv. 140; Kataf, xv. 94, 140
Banksia, culture of the genus, i. 120, ii. 24, 48, 72, 120, 144; occidentalis, iv. 20; care necessary in watering, v. 24; great degree of light required for, v. 181
Barbacenia purpurea, vii. 237
Barker's Rodriguezia, iii. 166
Barkeria Skinneri major, xiv. 262, xv. 1
Barnardia scilloides, vii. 66
Barosma, xiv. 227
Barred Yellow Moth, xiv. 167
Barren-wort, large-flowered, v. 151; violet-flowered, v. 123
Barringtonia speciosa, treatment of, iii. 72, 112; racemosa, vii. 260, xiv. 40; speciosa, xiv. 40
Bartholina pectinata, ii. 181
Bartonia aurea, iii. 69, iv. 18, v. 141
Barton (Dr.) on the irritability of the Dionœa, i. 62
Bastard Guava, xv. 64
Batatas betacea, vii. 234; bonariensis, vii. 142
Batemannia Colleyii, ii. 132, v. 67
Batschia canescens, xv. 151, 234
Bauhinia, ii. 107, 109
Baxter's Isopogon, iv. 20
Bdellium, xv. 93
Beauty in plants, what constitutes, vi. 66
Beautiful Scarlet Clerodendrum, iii. 217, 271
Bee Carpenter, xiv. 71; Upholsterer, xiv. 71; Orchis, xv. 33
Beech Tree, iv. 158
Begonia Evansiana, to preserve in winter, ii. 21; platanifolia, iii. 125; sanguinea, iii. 261; octopetala, iv. 68; Fischeri, iv. 18; monoptera, iv. 89; odorata, culture of, iv. 123; insignis, iv. 233; great quantity of water requisite for, v. 95; odorata, v. 69; octapetala, vi. 21; albo-coccinea, xiv. 133; atrosanguinea, xiv. 133; coccinea, xiv. 133; fuchsioides, xiv. 64, 133, 217; hydrocotylifolia, xiv. 133; incarnata, xiv. 133; manicata, xiv. 133; odorata, xiv. 133; valuable as winter flowers, xiv. 133; zebrina, xiv. 133; aurantiaca, xv. 214; insignis, xv. 22; rupestris, xv. 22
Bell-flowered Rose Bay, iii. 118
Bell-flower, dark-blue bearded, v. 16
Benthamia, ii. 226
Berberis vulgaris, irritability of the stamina of, i. 62; dealbata, ii. 78; empetrifolia, iii. 261, vii. 114; Fortuni, xv. 65, 209; ilicifolia, xiv. 139
Berendier's yellow-flowered Flax, iii. 116
Bessera elegans, vi. 138
Bibio hortulanus, xiv. 168
Biebersteinia, xiv. 227
Biennials, culture of greenhouse species, i. 66; stove, i. 67; selection of choice ones, i. 67, ii. 167, 216, iv. 72, 96, v. 192
Bifrenaria aurantiaca, iii. 215; flagellifera, iv. 44
Bignonia, hardy species of, ii. 37; greenhouse species, ii. 85, 86; stove species, ii. 107, 108, 251; Tweedieana, vii. 185; venusta, vii. 123; means to be adopted for flowering, vii. 124; æquinoctialis, xiv. 3; Chamberlaynii, xiv. 3; venusta, xiv. 261
Billardiera, ii. 87
Birds, on keeping in conservatories, ii. 286; rather useful than otherwise in a garden, vi. 231
Birthwort, pouch-flowered, v. 65; northern, vi. 53
Bischoff (M.) on the spiral vessels of plants, i. 58
Biston betularius, xiv. 167
Black Beetle, xiv. 70
Black Cloaked Moth, xiv. 72
Black glass a ready conductor of heat, but not of light, vi. 11
Bladder-wrack noticed, iii. 42
Blæria, ii. 92
Blandfordia grandiflora, vii. 219; management of, vii. 220
Blatta orientalis, xiv. 70
Bletia Tankervilliæ, culture of, i. 96; patula, iii. 263; distinction of the genus, from Phaius, v. 126; Parkinsoni, vi. 163; reflexa, vii. 113; Shepherdi, vii. 146; culture of the genus, vii. 154, xiv. 93; gebina, xiv. 272
Blighia sapida, vi. 60
Blight on gooseberries, ii. 41; on cabbages, ii. 41; on rose trees, ii. 41; on brambles, ii. 42; in herbariums, ii. 42; on berberries, ii. 42; on coltsfoot, ii. 42; on corn, ii. 43

Blimbing, xv. 229
Blood-red Sanguinea, iii. 261
Blumenbachia multifida, vi. 210
Blunt-calyxed Physostegia, iii. 165
Boenninghausenia, xiv. 227
Boerhaavia, ii. 107, 108
Bog-plants, a selection of, culture, &c., iv. 107
Boiler, Chanter's patent, ii. 249; diagrams and description of an oval, v. 39; remarks on the construction of, v. 63, xiv. 11
Bois du Poupart, xv. 41
Bojer's spurge, iv. 17
Bolbophyllum bracteolatum, v. 235; careyanum, iv. 21; barbigerum, interesting notices of, iv. 68, 132, 166; cocoinum, iv. 137; saltatorium, iv. 164; hirtum, xv. 21; Lobbii, xiv. 115
Bonatea, ii. 155
Bone-dust, probability of its proving a useful manure for flower borders, vii. 47
Bonnet, Mr., his definition of a plant, i. 32
Books, those most profitable to a young gardener, vi. 208
Boronia serrulata, i. 173; ii. 88, 120; pinnata, iii. 115, 192; crenulata, vi. 115, xiv. 267; new species of, vii. 261; xiv. 225; triphylla, xiv. 68
Boronieæ, xiv. 225
Boswellia serrata, xv. 90; glabra, xv. 90
Botany of Castle Eden, ii. 215; readiest way of beginning the study, ii. 94; main terms of, ii. 95
Botanical Register, notice of new plants figured in, ii. 77, 112, 163, 208, 259; Lexicon, review of a, v. 86; Classification, general view of, vi. 129; Expedition to North America, particulars concerning the loss of the collectors, vi. 135; literature, its possession of a peculiar idiom, vii. 37; Garden, Regent's Park, xv. 143, 167
Botany as a science, xv. 81
Bourbon Plum, xv. 41
Bouvardia triphylla, i. 225; ii. 72, 144, 240; iii. 48, 120; angustifolia, vi. 187; vii. 99; general treatment of, vii. 100; splendens, vii. 40; peculiar propagation of, vii. 40; objections to growing in the open border, vii. 100; Cavanillesii, xv. 189
Boxes for preserving plants on a sea-voyage, ii, 161—3
Brachycome iberidifolia, vii. 117; new species of, vii. 142
Brachysema latifolia, culture of, ii. 24, 48, 72, 86, 88; polymorpha, ii. 86
Braconnot, M. Henry, on labelling plants, i. 183; notice of his converting rags into sugar, i. 183
Bramble, striped-leaved, compost for, iii. 23
Brasavola cucullata and nodosa, ii. 133; cordata, iv. 20; Martiana, vi. 20; glauca, vii. 185, xv. 46; venosa, vii. 163
Brass beetle, xiv. 71
Brassia Lanceana, ii. 78; culture of the genus, ii. 133, iv. 95, 137; maculata, treatment of, vi. 5; Lanceana, *var.* viridiflora, vii. 88; verrucosa, vii. 91; brachiata, xiv. 115
Brazilian Heliconia, iii. 193
Brexia madagascariensis, xiv. 41
Bridesmaid moth, xiv. 168
British Flower Garden noticed, ii. 77, 112, 163, 208, 260; plants, hints on studying and collecting, vi. 38; great advantages of acquiring a knowledge of, vi. 39
Broad-leaved Lupine, iii. 260; Thorn, iii. 213
Bromeliaceæ, ii. 210
Brompton Stocks, ii. 29
Brossæa, ii. 92
Browallia Jamesonii, xiv. 190; speciosa, xv. 21
Brown cloaked moth, xiv. 72
Brown, Mr., plan of a flower-garden by, i. 154
Brown Orchis, xv. 33
Brownea coccinea, xiv. 40; grandiceps, xiv. 40
Brugmansia arborea, ii. 22; suaveolens, iii. 72, 104, 144; suaveolens, remarks on, iv. 87; Waymannii, iv. 241; sanguinea, xiv. 117
Brunonia australis, vii. 267; its cultivation, vii. 268, xv. 259
Brunsfelsia nitida jamaicensis, xiv. 92; americana, deciduous in a low temperature, v. 252
Brunsvigia, culture of, i. 163; poison obtained from, by the Indians, i. 164; iii. 24
Bryophyllum calycinum, xiv. 41
Bucku plants, xiv. 227
Budding, iii. 144, vi. 192, vii. 168
Buddleya madagascariensis, v. 260; Dr. Lindley's, xiv. 5; Lindleyana, xiv. 5
Bugloss, Rock, xv. 259
Bulbous plants, leading characters of, vii. 39; method of forcing, vii. 240; treatment requisite for those grown in pots or glasses for drawing-room windows, vii. 240
Bulbs, treatment of, in pots and glasses, i. 41; mode of forcing by steam, ii. 65; general culture of hardy, ii. 199; greenhouse, ii. 200; stove, ii. 201; notices of management, ii. 216, 264; proper for drying, iii. 120, 240; to be attended to, iv. 24, 72, 120, 192; management of stove, v. 119; change of soil useful to, v. 208; preparation of beds for hardy, v. 216; time for planting hardy, v. 240; remarks on forcing, v. 216; mode of treating exotic, v. 250; protection for hardy, v. 264; the germs of future stems, and not a part of the roots of plants, vii. 112
Bully tree, xv. 107
Bunge's Lychnis, iii. 166; Scarlet Campion, iv. 7
Burlingtonia candida, iv. 42, v. 237; maculata, vi. 187; venusta, vi. 115; rigida, vii. 68, xiv. 68, xv. 73; fragrans, xv. 190
Burtonia conferta, iii. 115, xiv. 42, xv. 258; pulchella, xv. 189, 258; villosa, xv. 190, 258
Butea frondosa, xiv. 41; superba, xiv. 41
Butomeæ, culture of, i. 121
Butterfly Orchis, xv. 32
Butterfly plant, v. 175; the Indian, v. 162, vii. 49
Bygrave Plant Preserver, i. 17; slug preventer, i. 17
Byrsanthes, xv. 9

C.

Cabbage blight, ii. 41
Cable Palm, xv. 235
Cactaceous plants multiplied by seed, v. 232; plants, summer exposure, vi. 120; culture of, vii. 178, 206, 225; viii. 71, 120, 192
Cactæ, iv. 96; grafting, v. 23, 69; propagation, v. 70; v. 232; v. 132; light necessary for, 133; importation of, vi. 43; training, ix. 187; growing on a wall, ix. 188; i. 49; grafting of, i. 51; ii. 144; iii. 250; x. 161
Cainito, xv. 18; purple, blue, Cuba, xv. 18
Cajanus bicolor, xii. 140
Caladenia longicauda, vii. 43
Caladium bicolor, iii. 24; petiolatum, vi. 115
Calamus Draco, xv. 235; rotang, rudentum, scipionum, zalacca, xv. 235; aromaticus, xv. 235
Calandrinia grandiflora, i. 222; speciosa, ii. 24, 48, 72, 120, 144; discolor, vi. 17; vii. 256; umbellata, xii. 165, 265; xii. 266; umbel-flowering, xii. 265
Calanthe, ii. 18, 155; densiflora, iv. 236; veratrifolia, iv. 119; discolor, vii. 234; flavicans, vii. 92; versicolor, viii. 261; Masuca, x. 167; ochracea, x. 94; Masuca, xi. 164; curculigoides, xiv. 65; vestita, xv. 263
Calathea villosa, xii. 70
Calceolaria bicolor, i. 246; integrifolia viscosissima, i. 269; corymbosa, variety Jupiter, ii. 218; Hopeana, ii. 266; ii. 24, 48, 72,

120, 144; iv. 24, 119, 144, 192; corymbosa, *var.* Talisman, iii. 27, 144; Victoria and Polyphemus, iii. 214, 216; floribunda, xii. 92; alba, xii. 116; amplexicaulis, xiv. 115; *spe. nov.*, xiv. 272; cuneiformis, xv. 164, 189
Calectasia cyanea, vii. 260
Calla æthiopica, v. 225; v. 226
Calliandra Tweediei, xii. 238; Harisii, xiii. 140
Callichroa platyglossa, vi. 89
Callionema pulchra, iv. 132; v. 139
Calliopsis bicolor atrosanguinea, ii. 243
Calliprora lutea, iv. 16; vi. 164
Callipsyche eucrosioides, xii. 188
Callistachya longifolia, vii. 142; linearis, viii. 163; longifolia, viii. 31; viii. 32
Callistemon microstachyum, v. 42
Callithauma angustifolium, viii. 92; viridiflorum, viii. 92
Calochilus, ii. 18
Calochortus venustus, i. 175; luteus, i. 221; ii. 20, 24, 72, 144, 192, 240; iv. 165
Calodendron capense, xii. 42, 227;
Calomeria, new species, xiv. 238
Calopogon, ii. 155
Calostemma, ii. 70; carneum, vii. 114; luteum, vii. 89
Calotropis procera, ii. 261
Calpicarpium Roxburghii, xiii. 70
Caltha sagittata, xi. 20
Calycanthus, ii. 226
Calycotome spinosa, xiii. 236; xv. 209
Calypso, ii. 181
Calyptranthes, xiv. 46
Calystegia pubescens, xiii. 165, 187, 243; xiv. 165
Calytrix aurea, vi. 259
Calyx, nature and varieties of the, vii. 163; difference between a superior and an inferior one, vii. 163, 234
Camaridium ochroleucum, xii. 44.
Camarotis purpurea, vi. 90; vii. 25
Cambium, its position and consistence, vi. 58; xv. 38
Camboge, xv. 206
Camellia, culture of, i. 33; ii. 144; Japonica Fordii, ii. 25; Chandlerii, ii. 73; Cunninghami, ii. 122; mutabilis, ii. 122; japonica candidissima, iii. 71; reticulata, iii. 101; anemoniflora and Rosa mundi, iii. 118; japonica Donckleari, iii. 142; japonica, *var.* imbricata, iii. 96, 143, 144; Donckleari, iv. 21, 71; iv. 24; bicolor, iv. 71; Hendersonii, iv. 43; iv. 72, 96, 114; house most suitable for, v. 180; v. 179, 72, 95, 144, 92; picturata, v. 68; Pressii rosea, v. 171; method of grafting, vi. 93, 112; vi. 111; elata, vii. 92; Doncklaerii, vii. 92; tricolor, vii. 92; management of, vii. 92; viii. 54; Albertii, viii. 53; Lowii, x. 95; their flower-buds, to thin, xii. 168; Low's jubilee, xii. 94; *Beauté suprème*, xiii. 71; remarks on the, xiii. 109; xiii. 109, 110; planting out under glass, xiii. 110; xiii. 111; to have in flower at any time, xiii. 112; japonica, xiv. 68; miniata, xiv. 169; reticulata, xiv. 93; value of, in winter, xiv. 137; fine *var.*, xv. 95; miniata, xv. 257
Campanula Loreyi, iii. 117; pumila and garganica, iii. 143; pyramidalis, iii. 207; Scheuchzeri, iv. 190; Portenschlagiana, iv. 232; barbata, *var.* cyanea, v. 16; pyramidalis, v. 72; carolina, vi. 164; punctata, vi. 164; fragilis, *var.* hirsuta, xi. 25; *Carolinæ*, xi. 25; grandis, x. 31; Læflingii, x. 92; *stricta*, xii. 245; integerrima, xii. 245; sylvatica, xii. 245, 246; *gentianoides*, xiii. 7; *grandiflora*, xiii. 7; nobilis, xiii. 142; lactiflora, xiv. 215; nobilis, xiv. 19; grandis, xv. 232; nobilis, xv. 234
Campbell, Mr., on the Nepenthes, i. 58
Camphor, analysis of, xi. 156
Campylanthera Fraseri, xii. 99
Canadian Desmodium, iv. 66
Canarina campanula, xiv. 42; lævigata, xiv. 42
Canavalia, ii. 107, 110; ensiformis, x. 165
Candollea tetrandra, x. 237
Canker in plants, ii. 46
Canna gigantea, indica, coccinea, patens, ii. 21
Cantau aggregata, i. 27; bicolor, xv. 142, 219; *Hoitzia*, xi. 238; pyrifolia, xv. 164
Canvas coverings for screening frames from frost, vii. 88; useful in warding off rain, vii. 264
Capparideæ, culture of, i. 122
Capparis ægyptica, xv. 255; heteracantha, leucophylla, sodaba, spinosa, xv. 255
Cape heaths, culture and propagation of, i. 113
Cape bulbs, ii. 270
Caprifolium hispidulum, ii. 113; hybrid, vi. 140; for covering the naked trunks of trees, vi. 14; hybrid, vii. 166; Youngii, viii. 181; sempervirens, grown to a pole, viii. 181, xiv. 249
Capsicum ustulatum, v. 197
Captain Mangle's Rhodanthe, iii. 116, 173; Rowe's Camellia, iii. 101
Caralluma fimbriata, i. 216
Carambola, xv. 229
Carbon, nature of, viii. 56; its origin, viii. 84; proportion contained in the air, viii. 105
Carbonic acid gas, how formed, viii. 129
Carbonised water, xi. 129
Carbonic acid, the absorption of, a primary office of leaves, xi. 35; to produce, xi. 178; an atmosphere of, contained in every fertile soil, xi. 250
Carbon, xi. 178; how received into the system of plants, xi. 230
Cardamine, culture of the genus, ii. 94
Carica citriformis, v. 43
Carnation, cultivation of, i. 68; Fletcher's Duke of Devonshire, Doncklearii, ii. 262, 210; Queen of Sheba, ii. 210; Pugh's Lady Hill, and Hogg's Colonel of the Blues, iii. 262; Bertrand, Prince de Nassau, Bijou de Clermont, iii. 214; removing young plants, iv. 48; sowing seed, iv. 96, 192
Carolina gardoquia, iii. 243
Caryophylleæ, ii. 210, 263
Casque-wort, Bauers, xiv. 49
Casselia integrifolia, xv. 75
Cassia glandulosa, ii. 260
Castle Eden Dean, ii. 215
Catalpa, ii. 226
Catasetum, ii. 133; luridum, iv. 45; v. 258; atratum, v. 258, vi. 140; integerrimum, vii. 210; longifolium, vii. 212; maculatum, vii. 237; Russellianum, vii. 40; callosum, viii. 18; citrinum, viii. 214; cornutum, viii. 18; deltoideum, viii. 189; laminatum, viii. 189; lanciferum, viii. 18; Trulla, viii. 140; planiceps, x. 47; viridi-flavum, x. 117; naso, xi. 237; saccatum, xii. 262; callosum, *var.* grandiflorum, xiii. 69; serratum, xiv. 115
Catchfly, showy, x. 219; xv. 261
Cattleya intermedia, i. 151; ii. 134; labiata, iii. 167; guttata, iv. 21; probable new species, iv. 96, 235; labiata, iv. 121, 166, 235; iv. 122; crispa, iv. 166; Harrisoniæ, iv. 247; Harrisoniæ, *var.* alba, v. 188; Mossiæ, *var.* 260; crispa, v. 5; Mossiæ, v. 187, 259; Perrinii, v. 18; pumila, v. 139; culture, v. 5, 83; bicolor, vi. 236, citrina, vi. 187; guttata, *var.* Russelliana, vi. 19; Aclandiæ, vii. 185; labiata, *var.* atropurpurea, vii. 73; Mossii, vii. 73; treating newly imported, vii. 74; Aclandiæ, viii. 214; bicolor, viii. 214; citrina, viii. 214; guttata, *var.* Russelliana, viii. 262; Harrisoniæ, *var.* alba, viii. 262; candida, ix. 262; granulosa, ix. 20; superba, ix. 263, 265, marginata, x. 262, 265; intermedia variegata, xi. 115; Skinneri, xi. 193; superba, xi. 90; new variety, xi. 93; granulosa, *var.* Russelliana, xii. 260; *vars.*, xii. 262; Grahami, xii. 1:

intermedia, var. *angustifolia*, xiii. 5 ; Lemoniana, xiii. 163 ; maxima, xiii. 21; *Perrinii*, xiii. 5 ; bulbosa, xiv. 188, xv. 49 ; citrina, xiv. 142, 190 ; new species, xiv. 141 ; Skinneri, xiv. 19, xv. 95 ; superba, xiv. 142
Catkin, description of a, vii. 161
Cavanilles, Collomia, iii. 70
Caybu Swa, xiv. 8
Cayenne cherry, xv. 64
Ceanothus azureus, ii. 74 ; collinus, vi. 140 ; pallidus, vii. 89, xv. 211 ; thyrsiflorus, xi. 164, xv. 211 ; *divaricatus*, xi. 164
Cedronilla pallida, xiii. 115
Celastrus, ii. 109
Celebes mangosteem, xv. 206
Cellular tissue, xi. 105
Cels's Hovea, iii. 241
Centaurea depressa, v. 161 ; pulchra, vii. 114
Centradenia rosea, x. 92, 101; its treatment, x. 102
Centropogon fastuosum, xii. 46, 273; surinam, xiii. 149; surinamensis, xiii. 149, 273, xv. 8, 11
Centrosema coccinea, xi. 121
Ceradia furcata, xv. 91
Ceratochilus oculatus,
Cerbera fruticosa, xiii. 70
Cephalanthus occidentalis, iv. 191
Cephalotus follicularis, i. 59, ii. 115
Cerasus japonica plena, xiv. 115
Cereus Napoleonis, iii. 44 ; serpentinus, iv. 89 ; senilis, iv. 213 ; pentalophus, *var.* subarticulatus, v. 113 ; speciosissimus, v. 134 ; speciosus and Jenkinsonii, v. 134 ; latifrons, vi. 186 ; leucanthus, vii. 66 ; Mallisonii, vii. 210 ; Martianus, vii. 17 ; multiplex, vii. 89 ; speciosissimus, *var.* hybridus, vii. 210 : flagelliformis, vii. 226 ; cærulescens, ix. 45 ; flagelliformis, ix. 188 ; speciosissimus, *var.*, ix. 213; speciosissimus, x. 163 ; flagelliformis, on grafting, x. 164 ; crenatus, xi. 139 ; extensus, xi. 42; Pitajaya, xi. 115 ; flowers, to prevent closing, xiv. 76 ; grandiflorus Maynardi, xiv. 75
Ceropegia, ii. 108; stapeliformis, iv. 89; elegans, bulbosa, iv. 168; vincæfolia, vi. 162 ; oculata, xi. 140
Ceroxylon, or wax palm, ii. 23
Cestrum viridiflorum, x. 143 ; aurantiacum, xv. 256, xii. 92, 214; *roseum*, xii. 118 ; aurantiacum, xiv. 77, 134 ; berries poisonous, xiv. 77 ; Bushmen's arrow-poison, xiv. 78 ; macrophyllum, xiv. 78 ; orange-flowered, xiv. 77; roseum, xiv. 193 ; tinctorium, xiv. 78; venenatum, xiv. 78
Cetonia aurata, xiv. 71 ; stictica, xiv. 71
Chænestis lanceolata, xv. 21 ; strigosa, xv. 239
Chætogastra gracilis, iii. 116
Chænostoma polyantha, xii. 141, xiv. 139
Chabræa runcinata, xi. 234
Chalky soil very retentive of moisture, vii. 10
Chalk, detaching it from soil, vii. 106 ; nature of, x. 59, xv. 250
Changing the habitude of plants, xi. 14, 37
Changes of elementary substances, xi. 178
Changeable-flowered Alkanet, iii. 94
Channels for hot water, xiii. 33, 34
Characteristics of the seasons, xiv. 175
Charcoal, value of, in pot culture, xii. 228
Chairs for the flower garden, i. 123, 220
Charlwoodia australis, iv. 44
Chatsworth, plant stove at, ii. 105 ; Emperor fountain at, xi. 223
Cheilococca apocynifolia, xiii. 195
Chelone centranthifolia, ii. 50 ; barbata alba, v. 139 ; mexicana, v. 212 ; Lyonii, vii. 269, xv. 234; obliqua, vii. 149, xv. 234 ; mexicanum, xi. 189
Chemical agents of soil, iv. 12 ; not exerted on things possessing vitality, vii. 130
Chemistry of nature, v. 11
Chemistry, vii. 130 ; utility to the gardener, vii. 130, xv. 106, 201, 225, 248 ; facts in horticultural, viii. 33, 55, 81, 105, 129, 153, 177, 201, 223, 249
Cherimoyer, xv. 132
Cherries, Barbadoes, xv. 78
Chilodia scutellarioides, culture of, v. 195
Chimonanthus fragrans, ii. 35, 226; grandiflora, ii. 35, 226 ; iv. 144, 192 ; ix. 105
China asters, iii. 120, 144
Chinese scarlet-flowered Air Plant, iv. 49
Chinese Aconite, v. 3
Chinese roses, directions for pruning, vii. 13 ; kinds suitable for massing, xiii. 41; situations for masses, xiii. 41 ; iv. 96, v. 72, 120
Chionanthus, ii. 226
Chirita sinensis, xi. 262 ; zeylanica, xii. 213 ; sinensis, xiii. 117 ; zeylanica, xiii. 265 ; sinensis, xiv. 65, 243 ; Moonii, xv. 166
Chironia peduncularis, ii. 140 ; trinervis, iii. 149 ; floribunda, xi. 237 ; *Fischeri*, xii. 123 ; floribunda, xii. 123 ; *decussata*, xiii. 221; *frutescens*, xiii. 221; glutinosa, xiv. 165, xv. 190. 245
Chlidanthus, ii. 70
Chlora exaltata, xii. 70 ; xiii. 99
Chloræa virescens, xii. 213, xiii. 117 ; *chrysantha*, xii. 213
Chlorophytum fitted for suspension, ix. 136
Chœnestis lanceolata, xv. 211
Choisya ternata, xiv. 225
Chorilæna, xiv. 225
Chorizema Henchmanni, ii. 171 ; ilicifolia, iii. 14 ; rombea, iii. 114 ; Baxteri, iii. 114 ; Henchmannii, iii. 114 ; ovata, iv. 95, 119, 153, 154 ; Henchmannia, iv. 95, 233 ; cordata, v. 42, 68, 97 ; scorpioides, v. 93 ; varium, vi. 115, 176 ; Dicksonii, vii. 92, viii. 173 ; spectabilis, viii. 118 ; varium, *var.*, ix. 117 ; cordatum, ix. 161; macrophyllum, x. 119 ; spartioides, x. 127 ; spectabilis, xi. 94 ; *oppositifolia*, xi. 171 ; triangulare, xiii. 73 ; triangular, xiii. 73, xv. 257
Chrysanthemum, history and culture of the Chinese, i. 187, ii. 120, 144, 168, 192, iii. 240, 264, iv. 96, 129, 168, v. 120, 144, vii. 191, 264, xi. 240, xii. 119; dwarf plants, to obtain, xii. 192, xiii. 273 ; xiv. 44 ; selection of, xiv. 46
Chryseis compacta, iv. 88
Chrysiphiala, ii. 70
Chrysobaphus Roxburghii, xi. 261
Chrysophyllum Cainito, xv. 180; C. jamaicensis, xv. 181; cæruleum, xv. 181; C. microphyllum, xv. 181; microcarpum, xv. 181; argenteum, xv. 182 ; angustifolium, xv. 183 ; macrocarpum, xv. 183 ; Michino, xv. 182 ; monopyreum, xv. 182
Chrysorrhoë nitens, vi. 258
Chunduru, xv. 89
Chundum, xv. 113
Chusan Daisy, xiii. 273
Chysis aurea, iv. 68, 71, 166, v. 140 ; bractescens, viii. 92
Cinchona longiflora, xii. 238
Cineraria Waterhousiana, iv. 219, 220 ; Hendersonii, iv. 43 ; the king, v. 92; hybrid, v. 19 ; hybrids belong to the genus Senecio, vi. 42 ; Waterhousiana, vi. 260 ; hybrid, viii. 118, ix. 71; splendida, ix. 71; Webberiana, ix. 125 ; management of the genus, ix. 126 ; Lady Prudhoe, xii. 149; Countess of Zetland, xii. 149 ; Emperor of Russia, xii. 149 ; Fairy Queen, xii. 149; sapphire, xii. 149 ; criterion, xii. 149 ; Surrey Hero, xii. 149 ; desirable, xii. 149 ; seedlings, xii. 149, 150 ; *vars.* xiii. 94; xiv. 135
Cinnamon, i. 147, ii. 168, iv. 103
Cinquefoil, rusty-brown flowered, v. 223; Mr. McNab's, xiii. 219
Circular conservatories, recommendation of, viii. 257
Cirrhæa Warreana, and other species, i. 15, ii. 135 ; tristis, iii. 262

Cirrhopetalum Medusæ, ix. 46 ; auratum, xi. 20, 117 ; candelabra, xi. 117; chinense, xi. 117; fimbriatum, xv. 189 ; Thouarsii, v. 44 ; Cumingii, viii. 165 ; chinense, x. 237; Thouarsii, xiii. 140

Cisterns for conservatories, various descriptions of, viii. 259

Cissus arborea, xv. 187

Cistus speciosus, iv. 213 ; culture, iv. 183; planting in beds, ix. 234

Citrus, culture of the genus, i. 88 ; japonica, xv. 164

Clammy Eutoca, iii. 17 ; Saracha, iii. 70

Clarkia guauroides, iv. 90

Cleisostoma rosea, vi. 189, xii. 165; ionosmum, xiv. 164 ; spicatum, xiv. 140

Clematis, ii. 35, 107, 108, 85, 87 ; iii. 31, 168 ; cærulea, iv. 116, 193; azurea grandiflora, iv. 119 ; Sieboldii, iv. 147, 213; cærulea, v. 119 ; cærulea grandiflora, v. 93; Sieboldii, v. 119 ; cærulea, vi. 116 ; Sieboldii, hardihood of, vi. 117; grafting, vi. 119; adapted for attaching to trees and shrubs, vi. 14 ; montana, vii. 210 ; cærulea, as a dwarf shrub, viii. 155 ; Sieboldii, training, viii. 156 ; cærulea, *var.* grandiflora, x. 20 ; montana, *var.* grandiflora, xi. 21 ; crispa, xiii. 262 ; *flore crispa*, xiii. 262 ; cærulea, for forming a bed, xiv. 231 ; polypetala, xiv. 25 ; tubulosa, xiv. 19, 31; glandulosa, xiii. 165; *glandulosa*, xiii. 236; *hexapetala*, xiii. 188 ; hexasepala, xiii. 188 ; smilacifolia, xiii. 235 ; *smilacina*, xiii. 236 ; *subpeltata*, xiii. 236

Cleome dendroides, i. 122; culture of the genus, i. 122 ; iii. 24 ; centranthifolia, iv. 167

Clermontia, xv. 12

Clerodendron speciosissimum, iii. 168, 217, 271 ; squamatum, vi. 164 ; speciosissimum, viii. 165; squamatum, different from C. speciosissimum, viii. 165 ; splendens, viii. 237; Kæmpferi, x. 189; species of, x. 262; calamitosum, xi. 169 ; fortunatum, xi. 169 ; infortunatum, xi. 91, 169; xii. 113; xiv. 16; fragrans, xiv. 33 ; squamatum, xiv. 33; splendens, xiv. 46, 103

Clethra, i. 233; ii. 88, 120, 244; quercifolia, xiv. 93

Clianthus puniceus, ii. 169, iii. 192, iv. 21, 134, v. 108, 110, ix. 82; carneus, viii. 212

Climate, its influence on plants, v. 110, 131, 155, 179, 203, vi. 33, 39, 84, 107, 132, 155, 181, 204; vii. 136

Climbing plants, iii. 96, 168, 216; stove plants, v. 113 ; vi. 240; training to poles, vi. 13 ; circular trellises for, vi. 118 ; natural habitats, vi. 14 ; checking the principal shoots of, vii. 96 ; pruning and dressing, vii. 216 ; roses, hints on pruning, vii. 13 ; plants, superior methods of training, viii. 64 ; conditions that affect their flowering, viii. 65; plan for supporting the dwarf kinds, viii. 254; instructions for managing, viii. 143, 168 ; keeping them dwarf, ix. 231 ; flowering, ix. 252 ; propagation of, x. 184 ; stove plants, xiv. 84, 105 ; as bushes, xi. 37; on pruning, xi. 39 ; cramping the roots of, xi. 40 ; layering the shoots of, xi. 41; natural mode of training, xi. 207 ; promoting the fertility of, xii. 12; Mr. Hoare's method for the vine adaptable to, xii. 14

Clintonia pulchella, iv. 145, 146, 240, v. 139 ; white-flowered variety of, viii. 141 ; xv. 9

Clintoniacæ, xv. 9

Clitoria, ii. 109; ternatea, vii. 147 ; fulgens, xi. 121 ; greater, xiii. 79 ; ternatea major, xiii. 79

Clivea, ii. 70 ; nobilis, iii. 72

Clowesia rosea, x. 186

Club-pod, purple-stemmed changeable, xii. 219

Coal, different kinds, ix. 251; the Moira kind, x. 34 ; origin of, xi. 250

Cobœa scandens, ii. 35, 85, 87; flowered Pentstemon, iii. 70, 23 ; macrosteam, vii. 41 ; stipularis, viii. 116 ; scandens, xii. 15

Coburghia, ii. 70 ; coccinea, viii 92 ; trichroma, viii. 92 ; humilis, ix. 190 ; versicolor, x. 20

Coca, uses and propagation of, iii. 34

Coccoloba, soil for, iii. 72

Coccus adonidum, xi. 240 ; hesperidum, xiv. 95 ; patellæformis, xiv. 95 ; testudo, xiv. 95

Cochlearia acaulis, xiii. 212 ; *pusilla*, xiii. 212

Cockchaffer, xiv. 71

Cockroach, xiv. 70

Cockscomb coral-tree, iii. 175

Cocoa-nut tree, culture of, iv. 40

Codonopsis lurida, xi. 166

Cœlogyne, ii. 133 ; fuliginosa, v. 237; Gardneriana, v. 20 ; maculata, v. 257; Gardneriana, vi. 37; ocellata, vi. 69, 92; Wallichiana, vi. 25; elata, vii. 237; aristata, viii. 235 ; Cumingii, viii. 116 ; flaccida, viii. 45, 140; fuliginosa, ix. 21; cristata, x. 70, xi. 69; Cummingii, xi. 237 ; xii. 262 ; early flowering, xiv. 7; ochracea, xiv. 19; præcox, xiv. 7; speciosa, xiv. 92, 165; flaccida, xv. 46; *spe. nov.*, xv. 142

Cœlia Bauerana, ix. 142

Coffæa not injured by a low temperature, v. 252

Cogaifeira, xv. 64

Cold frames, pits, &c., hints on, iv. 216

Cold, its nature explained, vi. 37

Cold winds, effects of, on plants, vii. 83

Coldness, comparative, of low and elevated tracts, viii. 36

Colea floribunda, viii. 92

Coleonema tenuifolia, xi. 45, xiv. 227

Coleus barbatus, viii. 92

Collania Andinamarcana, xiii. 187; dulcis, xiv. 140

Collinsia bicolor, iii. 141, 195, iv. 133; heterophylla, vi. 18

Collomia Cavanillesii, iii. 70

Colocasia odorata, ix. 93

Colophonia zeylanica, xv. 139

Colours, solar light the cause of, v. 182; grouping plants, vii. 167 ; produced by light, viii. 225; in flowers, x. 106; xiv. 161

Coltsfoot blight, ii. 42

Columbine, Mr. Skinner's, x. 199

Columnea, ii. 108 ; scandens, iii. 72, 192 ; aureo-nitens, iv. 92 ; Schiediana and splendens, ix. 135 ; splendens, ix. 263; Schiediana, ix. 31 ; leaf-soil adapted for, x. 136 ; splendens, x. 5; *zebrina*, xii. 142; Schiediana, xiv. 238

Colutea, ii. 227 ; frutescens, ii. 35

Comarostaphylis arbutoides, x. 143, xi. 118

Combretaceæ, remarks on, iii. 208

Combretum grandiflorum, i. 14; ii. 87, 120; stove species, ii. 107, 108; grandiflorum, ix. 169; macrophyllum, ix. 95 ; broad-leaved, xii. 103; latifolium, xii. 103

Combretum macrophyllum, xii. 103

Combustion, character of, ix. 249

Combustion probably caused by the development of latent light, viii. 225 ; its connexion with electricity, viii. 251

Comesperma gracilis, v. 93, 145, vi. 43

Commelina tuberosa, to preserve in water, ii. 21 ; cœlestis, iv. 131

Common Ladies' Slipper, iii. 247

Comparettia coccinea, vi. 19; rosea, vii. 237, viii. 238, x. 1; falcata, xi. 189

Composite flowers, structure of, vii. 161

Compositæ, ii. 262

Compounds found in plants, xi. 153

Conduction of heat, vii. 131

Conifers and taxads, xiii. 229 ; whence come the terms, xiii. 229; properties of, xiii. 229; unfavourable treatment they usually experience, and its effects, xiii.

230; the soil, situation, &c. they are most at home in, xiii. 232; the proper way to plant, xiii. 233; what should regulate the introduction of to, and disposal in, gardens, xiii. 233, 234; liberal treatment necessary for when growing, xiii. 258; why should be planted on elevations, xiii. 258; the way affected by severe weather, xiii. 259; the usefulness of, xiii. 260; slightly detailed account of some, xiii. 261
Comostephium pendulum, xiv. 212
Conduction of heat, capacity of several substances for the, vi. 36
Conradia floribunda, xiv. 238, xv. 99, 142
Conservative walls, their nature and usefulness, vi. 60; that at Chatsworth described, vi. 61; plan for a new one, vi. 61; list of plants for, vi. 63; mode of managing them, vi. 64; xii. 180; proper site for, xii. 181; formation of border for, xii. 181; proper time to plant, to train plants upon, &c., xii. 182; protection and winter management, xii. 183; suitable situation for tender plants, xii. 184
Conservatory, vi. 14; planting specimens in, vi. 13; grouping plants in, vi. 184; improper positions for, viii. 183; most suitable site, viii. 185; when high, not prejudicial to plants, if well glazed on all sides, viii. 232; description of various, xiii. 57, 58, 59
Conservatory plants, propagation of, ii. 15; hintso n planting, v. 181
Constitutions of plants generally similar, vi. 85
Convolvulaceæ, ii.
Convolvulus batata, iii. 199; heptaphyllus, xiv. 140; jalapa, xiv. 167; Pintestum, iv. 236; minor, iv. 190; ocellatus, xi. 21; Sibthorpii, xi. 237; bryoniæfolius, vi. 260; pentanthus, vi. 219, 220
Cookia punctata, xv. 261
Cooperia, chlorosolen, iii. 199
Corbett's, Mr., system of destroying slugs, i. 16
Corbularia tenuifolia, vi. 91
Corchorus japonicus, ii. 35, xiv. 33
Cordyline Rumphii, xiv. 65
Coreopsis tinctoria atrosanguinea, ii. 243; coronata, iii. 44; diversifolia, iii. 94; filifolia, iii. 212
Corethrostylos bracteata, xi. 118, 210
Corms, parts of the stem and not of the roots of plants, vii. 112; their consistence and character, vii. 113
Corn blight, ii. 43; flag, branching, vi. 99; flag, remarkable, vii. 223
Corolla, distinction and variations of the, vii. 231
Corræa speciosa grandiflora, v. 20. cordata, vi. 21; Milnerii, vi. 21; rufa, vi. 260; hybridising, vii. 80, 196; longiflora, vii. 195, 196; bicolor, vii. 45; densa, vii. 45; pumila, vii. 45; rosea, vii. 45; turgida, vii. 45; Harrisii, vii. 79, 80; new hybrid varieties of, xi. 273; rubescens, xii. 77; delicata, xii. 77; picta, xii. 77; ferruginea, xii. 77; pallida, xii. 77; Gaines' seedlings, xii. 77; xiv. 225; alba, xiv. 147; brilliant, xiv. 147; delicata, xiv. 147; magnifica, xiv. 147; new species, xiv. 47; pulchella, xiv. 147; roseo-alba, xiv. 147; rubra, xiv. 147; seedlings, xiv. 147; viridiflora, xiv. 147, xv. 257
Coryanthes, ii. 135; macrantha, iii. 95, v. 31; maculata, *var.* Parkeri, vi. 212; Fieldingii, xv. 76
Corycium orobanchoides, v. 186
Corymbose Witsenia, iii. 269
Corynocarpus lævigata, xv. 141
Cosmanthus fimbriatus, xi. 166
Cosmelia rubra, iii. 44
Cosmus scabiosoides, v. 66; tenuifolius, v. 15
Costus speciosus, iv. 245
Cotoneaster, ii. 227
Cottages, ornamental, designs for, i. 251
Cotton wool, useful to protect embryo inflorescence, xiii. 119
Cotyledons of plants, office of the, ix. 59
Couch-grass, when decayed, forms a good soil, x. 105
Coverings to plants, vii. 133; to glass roofs, ought not to be in contact therewith, vii. 133; excellent mode of constructing, vii. 88, 134; economise heat, viii. 23, 240, 259, 264
Cowa, xv. 206
Cowania plicata, iv. 211
Cowitch, culture of, iii. 20
Cow tree, notice of, iv. 128; vi. 113
Crambe cordifolia, viii. 165
Crassulas, culture of, vii. 256; *capitata*, xiii. 209
Cratægus oxacantha rosea superba, i. 198, ii. 208, 227; Douglassii, iii. 17; microcarpa, iii. 117; heterophylla, iii. 118; orientalis, iii. 141; platyphylla, iii. 213; pyrifolia, iii. 213; odoratissima, iii. 236; spatulata, iii. 260; tanacetifolia, iii. 236; flava, *var.* lobata, iv. 65; oxyacantha, *var.* Oliveriana, iv. 65; glabra, v. 12; crenulatus, xi. 234; pyracanthus, xi. 254
Creepers, list of hardy, ii. 33; greenhouse, ii. 85; stove, ii. 107; attention to, iv. 120, 168
Crescentia Cujeste, ii. 261
Crested maxillaria, iii. 19
Crimson-lipped Cattleya, iii. 167
Crinis peruvianus, i. 173
Crinum, culture of the genus, i. 99; longifolium, to preserve in winter, ii. 21; Commelini, vii. 45; undulatum, vii. 93; variabile, *var.* roseum, xi. 42
Criorhina narcissi, xiv. 168
Crisped-flowered Oncidium, iii. 166
Croci autumnales, xi. 21, xii. 163
Crocuses, culture of, i. 201; species and varieties of spring enumerated, i. 202; curious phenomena in, ii. 22; suaveolens, iii. 263; receptacles for early-flowering, viii. 17; Adamicus, viii. 116; speciosus, viii. 93; suaveolens, viii. 93; impropriety of removing their leaves, ix. 96; insularis, x. 92; Cartwrightianus, xi. 21; longiflorus, xi. 21; odorus, xi. 21; Pallasianus, xi. 21; pulchellus, xi. 21; Thomasianus, xi. 21; *damascenus*, xii. 163; *byzantinus*, xii. 163; *Tournefortianus*, xii. 163; *Cambessedianus*, xii. 163; *medius*, xii. 163; *pyrenæus*, xii. 163; *Cartwrightianus*, xii. 163; *var. creticus*, xii. 163; *Clusianus*, xii. 163; xiv. 66; byzantinus, xiv. 66; chrysanthus, xiv. 66; nivalis, xiv. 66; Salzmannianus, xiv. 66; veluchensis, xiv. 66; xv. 46
Crosley, J. T. Esq., hot water operating in the hothouse of, ii. 64
Crotalaria ——? xii. 165; *acuminata ?* xiii. 223; *angulosa*, xiii. 223; *cœrulea*, xiii. 223; verrucosa, xiii. 223; warted, xiii. 223
Crowberry-leaved Berberry, iii. 261
Crowea saligna, v. 260; broad-leaved, xiv. 222; latifolia, xiv. 222; saligna, xiv. 42
Crowned Coreopsis, iii. 44
Crucianella stylosa, v. 212, 233
Cruikshanks on heating by hot water, ii. 249
Crybe rosea, iii. 168
Cryptandra suavis, xi. 235; uniflora, xii. 43
Cryptomeria japonica, xiii. 273
Cultivation of Viola tricolor, iii. 5; of plants, the old system compared with the modern, vi. 249; dissimilarity caused by superior, vii. 173; difference between ancient and modern, ix. 36; xii. 135, 184; protrusion of roots through the bottom of pots, xii. 184; to prevent at the time of potting, xii. 184; proper floor to place plants upon in the open air, xii. 185; choice of situation for, xii. 187; of the genus Papa-

ver, iii. 11; Hydrangea hortensis, iii. 13 ; electro, attention directed to, xiii. 131
Cultural chemistry, xv. 201, 225, 248
Cummingia trimaculata, xi. 127 ; best way to treat, xi. 128
Cunninghamia, propagation of, ii. 212
Cunningham's Acacia, iii. 145
Cupani's Squill, iii. 215
Cuphea Melvilla, viii. 197 ; strigulosa, xi. 166, 241 ; broad-center'd, xiii. 267 ; cordata, xiii. 21, 165 ; miniata, xiii. 117; platycentra, xiii. 142, 267, xv. 257; *pubiflora,* xiii. 68 ; strigillosa, xiii. 68; miniata, xiv. 101; vermilion-flowered, xiv. 101 ; purpurea, xv. 215 ; silenoides, xv. 94
Cupressus Japonica, xiii. 273
Curcuma Roscoeana, v. 260 ; vii. 1, 238 ; species of, ix. 263
Curled Nightshade, iii. 1
Currants, red-flowering, i. 3 ; changeableness of, i. 3 ; yellow-flowering, i. 4 ; whitish-flowered, x. 55, xv. 208 ; double bloody-flowered, xii. 121
Cursory remarks, xi. 114, 162
Cushion-lipped Oncidium, iii. 4
Cusparieæ, xiv. 225
Cuttings, plan of a house for striking, i. 111 ; propagation by, ii. 240, xv. 35 ; excellent mode of striking, v. 178 ; speculation as to the origin of propagation by, vii. 202 ; philosophy of the process of striking plants by, ix. 81; method of raising them in water, ix. 82 ; where to strike, xii. 168
Cut flowers, to preserve, xii. 109
Cuticle of plants, tissue of which it is composed, vi. 180
Cyananthus lobatus, xiv. 66
Cyanothamnus, xiv. 225
Cyanotis axillaris, v. 260, xii. 262
Cychnochis Loddigesii, i. 14 ; maculatum, ix. 215 ; ventricosum, ix. 215; ventricosum, *var.* Egertonianum, xi. 21; Egertonianum, *var.* virides, xiii. 188 ; Loddigesii, xiii. 68 ; *stelliferum,* xiii. 188
Cyclamen, i. 180; Persicum, ii. 24, 48, 72, 88, 120 ; roots to be turned out, iv. 144 ; littorale, xiii. 236
Cyclobothra alba, i. 98 ; pulchella, i. 98 ; ii. 120
Cyclogyne canescens, vii. 117, 199; supposed habits and requisite treatment of, vii. 200, viii. 166
Cycnoches Loddigesii, ii. 135 ; chlorochilum, v. 260; ventricosum, iv. 190, vi. 189; chlorochilum, vii. 187 ; maculatum, vii. 213, ix. 215 ; ventricosum, ix. 215 ; Egertonianum, x. 214 ; pentadactylon, x. 92
Cymbidium, ii. 155, 181 ; triste, v. 91 ; iridifolium, vi. 261 ; pendulum, vii. 115 ; pubescens, viii. 163 ; Devonianum, x. 97 ; pendulum, *var.* brevilabrum, xi. 115; *giganteum,* xii. 241 ; *iridioides,* xii. 241 ; Mastersii, xii. 213; gigantic, xii. 241 ; giganteum, xii. 241 ; ochroleucum, xii. 44 ; *umbellatum,* xiii. 140 ; Mastersianum, xiv. 47 ; pendulum, xiv. 142 ; eburneum, xv. 22, 146
Cymbopogon Schænanthus, xv. 238
Cyme, the disposition of flowers in a, vii. 162
Cynoglossum cœlestinum, vi. 163 ; longiflorum, vii. 211 ; glochidiatum, viii. 68; anchusoides, ix. 70
Cyphia phyteuma, xiv. 42
Cypripedium, ii. 156, 181, 206 ; calceolus, iii. 247; barbatum, viii. 166, ix. 70, xi. 69, xiii. 140 ; Irapeanum, xiii. 235 ; *javanicum,* xiii. 140 ; *vars.,* xiii. 71
Cyrilla, ii. 92 ; pulchella, iii. 14
Cyrtanthus, ii. 69, iv. 249
Cyrtoceras reflexa, ix. 167, ix. 167, xi. 166
Cyrtochilum flavescens, ii. 135, iv. 212 ; bictonense, v. 188 ; maculatum, v. 93, 186 ; mystacinum, vi. 258 ; filipes, viii. 166, 259 ; maculatum, different varieties of, viii. 45 ; stellatum, x. 119 ; maculatum, *var.* xi. 45, xiv. 141
Cyrtopera gigantea, xii. 241
Cyrtopodium Andersonii, ii. 182, iv. 71, xi. 69 ; punctatum, xi. 118 ; punctatum, xiii. 133 ; a fine specimen described, xiii. 133
Cystanthe sprengelioides, vii. 234
Cytisus, ii. 227 ; racemosus, iv. 118 ; Æolicus, iv. 16 ; nubiginensis, v. 260; racemosus, v. 93 ; rhodaphne, 117; filipes, viii. 166; nigricans, viii. 228 ; Weldeni, x. 186 ; *spinosus,* xiii. 236

D

Dahlias, i. 104—7 ; Duke of Sutherland, ii. 209 ; superflua Lavinia, ii. 262; iii. 24, 93, 96, 120, 143, 264, iv. 48, 96, 120, 144, v. 120, 144, 168, 216, 264, vii. 216 ; glabrata, vii. 115; viii. 24 ; ranunculæflora, xiii. 8 ; *globularia multiflora,* xiii. 88 ; 89
Dais cotinifolia, xii. 190
Daisy extractor, i. 278
Dalmatian wall-flower, iv. 232
Damask roses, require but little pruning, vi. 13
Dancing Bolbophyllum, iv. 164
Daphne odorata, *var.* rubra, iii. 45 ; indica, *var.* rubra, vi. 261, xii. 263 ; japonica, viii. 46, 175, 176, xv. 210 ; Fortuni, xiv. 47, 66, xv. 71, 211
Darkness, its effects on plants, v. 112
Darwin's Botanical Garden noticed, ii. 195
Datura arborea, ii. 22 ; guayaquilensis, iv. 90 ; *arborea,* xiii. 211; cornigera, xiii. 211; *frutescens,* xiii. 211 ; Gardneri, xiii. 211
Daubenya aurea, iii. 19 ; fulva, vi. 235
Daviesia latifolia, iv. 223 ; ulicina, iv. 29 ; physodes, xiii. 163 ; new species, xiv. 117
Day lily, Dr. Siebold's, v. 25
Dean of Manchester's death, xiv. 144
Decaying flowers, importance of removing, x. 168
December, 1845, extraordinary mildness of, xiii. 9
Deciduous shrubs, iii. 240 ; plants best fitted for naturalization, viii. 14, 62
Decomposition of vegetables, v. 11 ; caused by heat, vi. 33, 34
Delicate Ionopsis, iv. 18
Delisseæ, xv. 11
Delissæa, xv. 12
Delphinium cheilanthum multiplex, ii. 241, iii. 16 ; densiflorum, iii. 45 ; moniliforme, iii. 77 ; macrostachyum, iii. 167 ; tenuissimum, iv. 41 ; montanum, iv. 67; Barlowii, iv. 88, 167 ; intermedium, *var.* pallidum, iv. 163 ; intermedium, *var.* cœrulescens, iv. 209 ; Barlowii, v. 265 ; intermedium, *var.* sapphirinum, v. 233 ; decorum, vii. 260 ; sinense, origin, habit, and treatment of, vii. 172 ; sinense, *var.* flore pleno, vii. 171, 172 ; cæruleum grandiflorum, xiv. 165
Dendrobium, culture of the genus, i. 15 ; fimbriatum, ii. 172 ; moschatum, ii. 136, 172 ; Harrisoniæ, ii. 196 ; cupreum, ii. 211 ; densiflorum, iv. 21 ; Pierardii, pulchellum, iv. 70 ; moschatum, &c., iv. 119 ; aggregatum, v. 66, 92 ; amplum, v. 237 ; aureum, v. 92 ; densiflorum, v. 121; fimbriatum, v. 67 ; Gibsonii, v. 169, 211 ; moschatum, v. 140 ; nobile, v. 67, 92 ; secundum, v. 92 ; 83, 121, 122 ; crumenatum, vi. 90 ; formosum, vi. 49 ; Jenkinsii, vi. 163 ; longicornu, vi. 21; macrochilum, vi. 91 ; nobile, vi. 44 ; Paxtoni, vi. 169 ; pulchellum, vi. 91 ; sulcatum, vi. 19 ; teretifolium, vi. 70 ; culture of the genus, vi. 50 ; divisions of the genus, vi. 145 ; aggregatum, vi. 145 ; aureum, *var.* pallidum, vi. 90 ; Cambridgeanum, vi. 265 ; chrysanthum, vi. 213 ; alpestre, vii. 187 ; amplum, vii. 121 ; pe-

culiar character of, vii. 122 ; aureum, *var.* pallidum, vii. 20 ; calceolare, vii. 117; cœrulescens, vii. 46 ; cupreum, vii. 117 ; denudans, vii. 238 ; Devonianum, vii. 169 ; best cultivated in baskets, vii. 170 ; fimbriatum, remarkably prolific specimen of, vii. 69 ; macrophyllum, vii. 68, 93 ; moschatum, vii. 117; nobile, vii. 7 ; difference in the culture of young and old plants of, vii. 8 ; revolutum, vii. 213 ; diversity of habitude in the species of, vii. 121 ; anosmum, xii. 142 ; amœnum, xii. 142 ; fimbriatum, *var.* oculatum, xii. 116 ; Captain King's, xii. 97 ; Kingianum, xii. 46, 97, 260 ; suitable temperature for, xii. 98 ; calamiforme, viii. 46 ; discolor, viii. 46, 95, 212 ; elongatum, viii. 46 ; fimbriatum, appropriate way of growing, viii. 157 ; Heyneanum, viii. 70 ; macrophyllum, viii. 97; its culture, viii. 98 ; pulchellum, *var.* 95 ; sulcatum, viii. 189 ; denudans, ix. 22 ; discolor, ix. 20 ; macranthum, ix. 238 ; nobile, ix. 22 ; Pierardii latifolium, ix. 95 ; undulatum, ix. 20 ; aqueum, x. 237 ; crumenatum, x. 189 ; cucumerinum, x. 165 ; rhombeum, x. 68 ; Ruckeri, x. 260 ; sanguinolentum, x. 20 ; taurinum, x. 143, 217 ; its culture, x. 218; æmulum, xi. 69 ; amænum, xi. 166 ; compressum, xi. 235 ; Dalhousieanum, xi. 145 ; way to manage, xi. 146 ; Devonianum, xi. 118 ; Heyneanum, *var.*, xi. 118 ; linguæforme, xi. 45 ; pulchellum purpureum, xi. 94 ; secundum, *var.*, xi. 189 ; xiii. 165 ; aduncum, xiii. 69 ; Dalhousieanum, xiii. 43 ; hymenophyllum, xiii. 142 ; anosmum, xiv. 93, xv. 97 ; chrysotoxum, xiv. 164 ; Egertoniæ, xiv. 164 ; heterocarpum, xiv. 68 ; Kuhlii, xiv. 213 ; mesochlorum, xiv. 164 ; new species, xiv. 66, 117 ; speciosum, xiv. 47 ; triadenium, xiv. 66 ; Veitchianum, xiv. 115 ; Farmeri, xv. 241; *spe. nov.*, xv. 95, 190; sanguinolentum, xv. 190
Dendrochilum filiformis, viii. 189
Dense-flowered Dendrobium, iii. 45 ; Oleander, iii. 73
Design for a flower stand, ii. 23
Desmodium Canadense, iv. 66
Deterioration of soil, its causes, v. 206
Deutzia, ii. 227 ; scabra, iv. 113, 189 ; perfectly hardy, v. 95 ; canescens, vi. 70 ; corymbosa, vii. 18, xv. 208 ; to flower freely, viii. 157
Developments of plants not fortuitous, vi. 58, ix. 33 ; Mr. Main's theory of, ix. 58
Dews, origin of, vi. 35, xv. 129, 153
Dianthus barbatus, or Sweet William, i. 67 ; hybridus, or mule pink, i. 67 ; caryophyllus, or carnation, i. 68 ; plumarius, or common garden pink, i. 74 ; caryophyllus, *var.* Emmeline, iii. 18 ; Frederica, iii. 18, 120 ; superbus flore plenus, iv. 213 ; Bisignani, v. 138 ; Hendersoni, xiii. 189, xiv. 126
Diary, its value to a young gardener, vi. 230
Diastema ochroleuca, xiii. 212
Dichorizandra thyrsiflora, iii. 127; ovalifolia, xii. 142, xv. 5, 239
Dicripta bicolor, viii. 262
Dictamneæ, xiv. 227
Didymeria, xiv. 225
Didymocarpus crinitus, xiii. 142
Dielytra spectabilis, xiv. 66, xv. 46, 127, 233
Diervilla, xiv. 249
Diffusion of seed, iii. 161
Digging, advantages of frequent, v. 239
Digging borders, propriety of it discussed, x. 264
Digitalis, hints on the genus, iii. 43; *chinensis*, xiii. 70 ; lutea, *var.* fucata, ix. 46 ; purpurea, *var.* superba, x. 29 ; places in which it should be grown, x. 30, xv. 234
Diglottis, xiv. 223
Dillenia speciosa, xiv. 83
Dillwynia glycinifolia, iv. 99 ; clavata, vii. 117 ; speciosa, vii. 27 ; clavata, xi. 5, xv. 256 ; its cultivation, xi. 6 ; tenuifolia, xi. 94
Dimocarpus longana, xv. 85 ; litchi, xv. 85 ; nephelium, xv. 85 ; crinita, xv. 86
Dinœa muscipula, its peculiar irritability, i. 54 ; experiments upon, by Mr. Knight, i. 61 ; Dr. Barton's opinion respecting, i. 62, iii. 252
Dioscorea sativa, noticed, iii. 200 ; alata, iii. 200
Diosma, xiv. 227
Diospyros sapota, x. 21
Diplacus puniceus, vi. 140 ; culture of, vi. 222
Dipladenia crassinoda, xi. 237 ; see *Echites* ; thick-jointed, xii. 25 ; crassinoda, xii. 25 ; how to treat, xii. 26 ; crassinoda, xiv. 107 ; nobilis, xiv. 238; splendens, xiv. 106
Diplolæna Dampierii, vii. 142, viii. 260, xi. 22 ; xiv. 225 ; angustifolia, xi. 22
Diplopappus incanus, ii. 49
Diplopeltis Hugelii, vii. 18, xi. 212
Dipodium punctatum, iv. 189
Dipsacus fullonum, i. 60
Dipteracanthus, xiv. 30 ; scandens, xiv. 68, 92
Disa, ii. 157, 182 ; cornuta, xi. 140; grandiflora, xi. 91
Disbudding flowering plants, hints on, x. 61
Diseases and affections of plants, xiii. 201 ; what they consist of, xiii. 201
Disocactus biformis, xii. 44
Dissemma aurantia, xii. 44
Distinctions betwixt plants and animals, i. 32
Diuris, ii. 157, 182 ; filifolia, vii. 43
Dodecatheon integrifolium, v. 16
Dombeya erythroxyla, xv. 23
Dombrowskya, xv. 9
Doncklaer's Japan Camellia, iii. 142
Doncklaeria diversifolia, x. 70
Dortmannia, xv. 10
Doryanthes, ii. 70
Double-lipped Larkspur, iii. 16
Double pots recommended for particular kinds of plants, v. 177; flowers, list and culture of hardy, x. 139
Douglas Thorn, iii. 17
Douglasia nivalis, iii. 236
Douglas's Limnanthes, iv. 66
Dove-plant, xiv. 146
Dracæna terminalis, ii. 78
Dracocephalum altaiense, xiii. 51 ; grandiflorum, xiii. 51
Dragon's-blood Palms, xv. 235
Dragon-tree-leaved Adam's needle, iii. 263
Dragon's head, great-flowered, xiii. 51
Draining flower or shrubbery borders, great utility of, vii. 263 ; essential in acclimatizing plants, viii. 13, 37, 62, xv. 104
Dr. Bunges' Scarlet Campion, iii. 45
Dr. Gillies's flower fence, iii. 17
Dr. Wells on Dew, xv. 130
Dropmore, pleasure grounds at, described, xiii. 108
Drosera, the supposed irritability of the species explained, xiii. 62; peculiarities in the time of flowering noticed, xiii. 62
Drummond's Pink-flowered Vervain, iv. 19 ; Zephyranthes, iii. 95
Dryandra longifolia, iii. 171 ; pteridifolia, iii. 212 ; arctotidis, x. 186 ; formosa, xi. 187 ; carduacea angustifolia, xiv. 188
Drymonium bicolor, iv. 190, v. 18 ; (?) new species of, xi. 273 ; punctata, xi. 116
Dryness indispensable to tender plants in the winter, viii. 12, 23
Dryobalanops camphora, i. 243
Dry stove plants, ii. 53
Ducts, explanation of the term, xi. 106
Duke of Bedford's Oncidium, iii. 71
Duramen, explanation of the word, vi. 67

Dutrochet's discovery of a supposed nervous system in plants noticed, i. 31 ; on the sleep of plants, ii. 80
Duvaua longifolia, x. 261
Dwarfness, a constituent of beauty in plants, vii. 99 ; to induce, in plants, xi. 40
Dwarf shrubby plants, xv. 259
Dyckia variflora, ii. 210 ; rariflora, iii. 19
Dysophylla stellata, xii. 92, xiii. 94; xiv. 271

E.

Eagle Wood, xv. 44
Ear-leaved Nemophila, iii. 164
Early planting, iii. 9 ; training, ix. 39, 120
Earths, mode of analysing, viii. 33
Earwigs, means for entrapping, v. 192
Ebenus, ii. 228
Eccremocarpus scaber, ii. 37 ; longiflorus, ii. 37
Echeveria racemosa, iv. 116 ; acutifolia, ix. 116 ; rosea, ix. 93 ; secunda, vii. 235 ; treatment of, vii. 256 ; lurida, viii. 18 ; pulverulenta, viii. 189 ; Scheerii, xii. 116 ; gibbiflora, xiii. 210
Echinacea Dicksonii, v. 116 ; intermedia, xiv. 190, xv. 97, 233
Echinocactus sessiliflorus, iv. 89 ; mammillarioides, iv. 67 ; Mackieanus, iv. 68 ; Eyriesii, *var.* glaucus, v. 138 ; tubiflorus, v. 17 ; grafting, v. 23, 69 ; culture of the genus, vii. 206 ; corynodes, viii. 260 ; centeterius, ix. 238 ; tenuispinus, ix. 190 ; concinnus, xi. 235 ; Pentlandi, xi. 262 ; oxygonus, xii. 140; myriostigma, xii. 188 ; Lecanus, xii. 213 ; multiflorus, xii. 214 ; pectiniferus, xii. 238 ; hexædrophorus, xiv. 164 ; Williamsii, xiv. 92 ; chloropthalmus, xv. 142
Echites, i. 97 ; stellaris, ii. 107, 109 ; suberecta, vi. 165, vii. 101; atropurpurea, ix. 199, 200; splendens, ix. 261 ; hirsuta, x. 47 ; splendens, x. 25, 26 ; *carassa*, xi. 213 ; see *Dipladenia* ; crassinoda, xi. 237 ; hirsuta, xi. 94 ; splendens, xi. 213 ; *carassa*, xii. 25 ; *crassinoda*, xii. 25 ; *grandiflora*, xiii. 103 ; *spe. nov.*, xv. 191 ; Franciscea, xv. 263
Echium giganteum, v. 149 ; petræum, x. 117 ; xv. 259
Eclipse of the sun, its effects on flowers, vi. 10
Economy, false notions of, in the construction of floricultural erections, viii. 232 ; of heat, vi. 274 ; of manures, xi. 108 ; in floriculture, x. 180, 228, 252
Edgworthia chrysantha, xiv. 213
Edwardsia, ii. 228 ; chilensis, iii. 90 ; grandiflora, iii. 90 ; microphylla, iii. 91 ; chrysophylla, iii. 91 ; myrtifolia, iii. 91 ; nitida, iii. 92 ; denudata, iii. 92 ; Macnabiana, vi. 162, xv. 209
Elæocarpus peduncularis, xiii. 188
Eleagnus parvifolia, x. 238
Electrical fluid, vii. 180 ; wires, xiii. 153, 154
Electricity, viii. 57, 177, 224, 249, 251 ; its agency on vegetation, x. 202 ; its influence in chemical phenomena, xi. 178 ; and vegetation, xiii. 129, 153 ; xiv. 128
Electro-culture, xiii. 131
Electronometer, utility of the, xiii. 156
Elegant globe-flowered Fuchsia, iv. 75
Elementary organs of plants, xi. 105
Elements of vegetable organisation, viii. 55, ix. 177
Eleocarpus cyaneus, xi. 214
Elephant's ear, scaly, xii. 73 ; white and scarlet, xiii. 245
Eleutherine anomala, x. 261
Ellis, Mr., on Dionœa muscipula, i. 61
Elliottia, ii. 92
Embellia grossularia, xv. 187
Embryo, description of the, vii. 259
Emmeline Picotee, iii. 18
Emperor fountain at Chatsworth, xi. 223
Empetrum nigrum, xi. 253
Emphytus fasciatus, xiv. 71 ; nigricans, xiv. 71
Empleurum, xiv. 227
Endogenous plants, distinctive features of, vii. 37
Enkianthus, i. 232 ; ii. 228
Enkianthus quinqueflorus, v. 127
Entire-leaved Siberian Primrose, iii. 18 ; Jaborosa, iii. 141
Epacrideæ, i. 53, xv. 257
Epacris impressa, ii. 97, 88, 144 ; Epacrideæ, ii. 120, 144, iii. 115 ; impressa, iv. 44, 69, 126 ; variabilis, iv. 69, 126 ; microphylla, v. 138 ; coccineus, vi. 70, 123 ; impressa, *var.* parviflora, vi. 89 ; Craegii, ix. 71 ; hybrid, ix. 22 ; new species of, ix, 47 ; grandiflora, x. 52 ; autumnale, xi. 195, 196 ; *Cunninghami*, xi. 195 ; miniata, xi. 141 ; *refulgens*, xi. 195, variabilis, xi. 46 ; miniata, xii. 5 ; prevalent source of mischief amongst the tribe of, xii. 6 ; vermilion, xii. 5 ; dubia, xiii. 163 ; hyacinthiflora, xiii. 71 ; new variety, xiv. 93 ; Taunton hybrid, xiv. 195 ; Tauntoniensis, xiv. 195; campanula maxima, xv. 166, 193 ; bicolor, xv. 166, 193 ; delicata, xv. 166, 193 ; andromedæflora, xv. 166 ; *spe. nov.*, xv. 166
Epidendron fragrans, ii. 217 ; stenopetalon, ii. 164, 136 ; moschatum, ii. 241 ; armeniacum, iii. 167 ; Skinneri, iii. 167 ; bifidum, iii. 215 ; æmulum, iv. 17 ; macrochilum, iv. 18 ; Skinneri, iv. 21 ; chloroleucum, iv. 68 ; bicornutum, iv. 95 ; Imetrophyllum, iv. 119 ; elongatum, iv. 119 ; bicornutum, v. 246 ; floribundum, v. 44 ; ionosma, v. 118, 164 ; papillosum, v. 18 ; Schomburgkii, v. 234 ; tenuiflorum, v. 212 ; tesselatum, v. 66 ; viridi-purpureum, v. 162 ; diceratum, vi. 91 ; lentiginosum, vi. 22 ; macrochilum, vi. 44 ; Schomburgkii, vi. 70 ; stenopetalum, vi. 236 ; armeniacum, vii. 238 ; Boothianum, vii. 288 ; cepiforme, vii. 18 ; cinnabarinum, vii. 118 ; floribundum, vii. 261 ; glumaceum, vii. 18 ; papillosum, vii. 143 ; Parkinsonianum, vii. 41 ; Skinneri, vii. 30 ; vitellinum, vii. 139 ; alatum, viii. 141 ; calochocheilum, viii. 235 ; Grahami, viii. 163 ; phœniceum, viii. 190 ; cinnabarinum, ix. 116 ; lancifolium, ix. 213 ; phœniceum, ix. 97, 98 ; raniferum, ix. 165 ; Skinnerii, ix. 22 ; selligerum, x. 119 ; vitellinum, x. 189 ; Schomburgkii, x. 121, 122 ; calocheilum, xi. 167 ; macrochilum roseum, xi. 243, 244 ; pterocarpum, xi. 140 ; radiatum, xi. 167, 210 ; Stamfordianum, xi. 70 ; verrucosum, xi. 189. 235 ; vitellinum, xi. 49, 50, dipus, xii. 19 ; radicans, xii. 145 ; rooting, xii. 145 ; longicolle, xii; 140 ; xiii. 166 ; *umbellatum*, xiii. 140 ; verrucosum, xiii. 101 ; warted, xiii. 101 ; plicatum, xiv. 140 ; pumilum, xiv. 7 ; pyriforme, xiv. 213 ; aurantiacum, xv.
Epidendrum grandiflorum, xii. 117 ; *rhizophorum*, xii. 145
Epigæa repens, fitted for forming a bed, ix. 230
Epimedium Musschianum, vi. 185
Epimedium macranthum, iv. 18, v. 152 ; violaceum, v. 68, 123
Epipactis, ii. 182
Epipactus latifolia, xv. 32
Epiphora pubescens, xi. 70
Epiphylla, suspending in baskets, ix. 136 ; leaf-soil good for, x. 137 ; comprehensive system of cultivating, vii. 225
Epiphyllum splendidum, i. 49 ; speciosum, iv. 22 ; Russellianum, vi. 88 ; oxypetalum, vii. 186 ; speciosum, vii. 226 ; beneficial effects of exposure on, vii. 228 ; purpurascens, viii. 22, 80 ; truncatum, *var.* violaceum, viii. 79, 80 ; Russellianum, x. 245, 246 ; Ruckeri, xii. 46 ; coccineum grandiflorum, xv. 259

Epiphytes, on growing plants as, xiii. 17

Episcia bicolor, xv. 189

Eranthemum albiflorum, ix. 93 ; variabile, ix. 75 ; variable, ix. 75 ; montanum, x. 187 ; pulchellum, xi. 55 ; *flava*, xi. 210, xiv. 134 ; strictum, xiv. 171 ; variabile, xii. 262

Eras in Botany, xv. 82

Eremostachys laciniata, xii. 214

Eria stellata, ii. 137, iv. 234 ; callosa, vi. 139 ; ferruginea, vi. 139 ; densiflora, vii. 188 ; armeniaca, viii. 187 ; bractescens, viii. 718 ; convallarioides, viii. 260 ; longilabris, viii. 118 ; paniculata, ix. 71 ; polyura, ix. 142 ; floribunda, xi. 91 ; bractescens, xi. 116 ; vestita, xii. 91 ; profusa, xii. 46 ; Dillwynii, xii. 140 ; species, new, xiv. 262 ; convallarioides major, xiv. 272

Eribotrya Japonica, iv. 111

Erica, i. 113, 236, ii. 91, 260, 264, iii. 48 ; chloroma, v. 65 ; florida, *var.* campanulata, v. 65 ; shading beneficial to the genus, v. 156 ; causes of ill-success in cultivation, v. 156, 204 ; a separate house requisite for the genus, v. 156 ; tricolor, *var.* superba, vi. 3 ; Banksiana, vii. 243 ; Jacksonii, viii. 149 ; managing the genus, viii. 150 ; Neillii, ix. 195 ; hybrid, ix. 196 ; Cavendishiana, x. 167 ; cerinthoides, x. 257 ; jasminiflora, xi. 91 ; Murrayana, xi. 77 ; hardy species of, for winter gardens, xi. 253 ; transparens, *var.* blanda, xii. 23 ; Cavendishiana, xiii. 3 ; its origin, xiii. 3 ; imperialis, xiv. 117 ; aristata, xv. 1 ; coccinea major, xv. 190 ; ventricosa grandiflora, xv. 190 ; *seedling var.* xv. 263

Erinus, large-flowered, xv. 259

Eriobotrya japonica, xiv. 34

Eriostemon, buxifolium, cuspidatum, iv. 132 ; buxifolium, xi. 165 ; scabrum, xi. 190, xiii. 127 ; intermedium, xii. 94 ; rough, xiii. 127 ; xiv. 225 ; nereifolium, xv. 95

Erysimum Perowskianum, vi. 165 ; culture of, vi. 246

Erythrina cristagalli, iii. 175 ; as a half-hardy border shrub, viii. 85 ; Bidwilliana, xiv. 66, 213 ; herbacea, cristagalli, lancifolia, xv. 51

Erythrochiton braziliensis, x. 212, xiii. 117, xiv. 223

Erythronium grandiflorum, ii. 262

Erythroxylon coca, uses and properties of, iii. 24

Escallonia montevidensis, ii. 51 ; pulverulenta, iii. 17 ; montevidensis, vii. 137 ; organensis, xiv. 20, xv. 209

Eschscholtzia crocea, iii. 49

Esculent roots, iii. 199

Esenbeckia febrifuga, xiv. 225 ; pilocarpoides, xiv. 225

Estate, description of an, xiii. 105

Eucalyptus splachnicarpon, x. 213 ; Preissiana, xiii. 262 ; xv. 256 ; macrocarpa, xiv. 272 ; xv. 29, 257

Euchætis, xiv. 227

Eucharidium concinnum, iv. 135

Eucomis punctata, thrives well in an open border, viii. 86

Eucrosia, ii. 70

Eudiosma, xiv. 227

Eugenia, Psidium, iii. 72 ; pseudopsidium, xv. 64 ; cauliflora, xv. 64 ; dysenterica, Michelia, Jambos, xv. 62 ; myrtifolium, xi. 82

Eulophia, ii. 158, 182 ; cochleata, iv. 21 ; macrastachya, iv. 164

Euonymus japonicus, xi. 22

Euphorbia fulgens, culture of, iv. 31, 236 ; jacquinæflora, iv. 21 ; Bojera, iv. 17 ; punicea, iv. 236 ; Jaquiniflora, v. 185 ; rigida, v. 185 ; veneta, v. 42 ; Bryonii, ix. 95 ; jacquiniflora, xiv. 133 ; splendens, xiv. 133

Euphoria Litche, xv. 85 ; longana, informe, nephelium, pinnata, verticillata, xv.

Euricles, ii. 70

Eustoma silenifolium, xii. 70 ; exaltatum, xii. 70, xiii. 99 ; *silenifolium*, xiii. 99 ; tall, xiii. 99

Eutaxia pungens, iii. 245

Euthales macrophylla, viii. 19

Eutoca viscida, iii. 17, iv. 165, 235 ; Menziesii, iii. 142 ; viscosa, iv. 116 ; Wrangeliana, v. 117, 187, 199, 200, iv. 165, 235 ; viscosa, iv. 116

Euryale, characteristics of the genus, v. 47 ; amazonica, xiv. 23

Evaporation occasioned by heat, vi. 86

Evelyn, John, his taste for gardening, iii. 40

Evolvulus cæruleus, xiii. 166 ; purpureo-cæruleus, xv. 21, 166, 171

Evergreens, on planting, ii. 114, 222 ; to be pruned, iv. 168 ; importance of light in the winter season, v. 250 ; not so suitable as deciduous plants for naturalising, viii. 14 ; dwarf sorts for planting on lawns, viii. 38 ; advantages of pruning in summer, x. 167 ; removal of, in hot weather, xiii. 178

Everlasting flowers, remarks on, v. 247

Exacum tetragonum bicolor, xv. 21

Excrementitious slime exuded from the roots of plants, v. 206

Exhalations from plants, their causes, channels, and consequences, vi. 86

Exogenous plants, general features of, vi. 178 ; direction of the woody matter of, xi. 35

Exogonium purga, xiv. 227

Exostema longiflorum, xii. 238

Exotic plants, advantages of devoting attention only to one or two kinds of, v. 182 ; importance of commencing to protect them early in the autumn, v. 251 ; importance of uniformity in the system of treating, vi. 167 ; necessity for arranging them at a proper distance from each other, vi. 119, 263

Exotic shrubs multiplied by grafting, vi. 93

Exotics, acclimatation of, viii. 60 ; proper borders for, viii. 11

Experiments, value of, vi. 233

Exposure of plants, xv. 117

F.

Fabiana imbricata, vi. 141

Facts, great advantage of amassing, vii. 135

Fagi—Kadsura—Akebi, xiv. 115

Fagopyrum cymosum, xiii. 115

Fagræa obovata, xiii. 22

Falcate-leaved Sarcochilus, iii. 71

Fasciculated roots, described, vii. 112

Fedia graciliflora, xii. 165 ; grandiflora, xv. 164

Fernandezia lunifera, vii. 213, xi. 238

Ferns, stove species, i. 171 ; management of, iii. 40 ; adaptation of leaf-mould for, x. 136 ; management, xi. 84 ; value of, in ornamental gardening, xi. 85 ; for rockeries, and covering walls, xi. 86 ; for suspending in baskets amongst Orchidaceæ, xi. 87 ; for undergrowths in conservatories, xi. 88 ; routine of culture, xi. 89

Fern-leaved Dryandra, iii. 212

Ferraria azurea, v. 187

Fertility of plants occasioned mainly by heat, vi. 132 ; how it is fostered, ix. 252

Few-flowered Dyckia, iii. 19

Ficus stipulata, iv. 227

Fig tree, remarkable effects of sudden exposure on a, v. 203

Fire heat during the winter months, v. 192, 252, 263 ; hints on the employment of, vii. 24, 72 ; how to economise, x. 228

Fire, nature of, ix. 249

Fires without smoke, v. 13, 80

Fir tribe, botanical characters of some of the, xiii. 107

Fischer's Begonia, iv. 18

Five flowered Gentian, iii. 165

Fixed vegetable oils ; analysis of, xi. 156

Flat Pea, beautiful, xiii. 195

Flints available in the formation of rockeries, v. 229

Floral curiosities, xi. 13

Floriculture, economy in, x. 180, 228, 252

Floricultural Notices, iii. 20,43, 68, 70, 92, 94, 115, 117, 139, 141, 163, 165,187, 189,211, 213,235, 237, 262, 263, 273, vii. 17, 40, 66, 88, 114, 139, 163, 184, 210, 234, 260—2, viii. 18, 43, 67, 91, 139, 163, 187, 211, 235, 259, 273, x. 20, 46, 91, 117, 142, 165, 186, 212, 237, 259, xi. 20, 42, 68, 90, 115, 139, 164, 187, 210, 234, 260, 273, xii. 22, 45, 94, 118, 141, 165, 190, 214, 262 ; for January, xii. 18 ; Feb., xii. 43 ; Mar., xii. 69, 91; April, xii. 91; May, xii. 115; June, xii. 140 ; July, xii. 163 ; Aug., xii. 188; Sept., xii. 212 ; Oct., xii. 237; Nov., xii. 260; Dec., xii. 18; xiv. 22, 46, 65, 91, 115, 139, 164, 188, 213, 238, 262, 272, xv. 21, 46, 71, 94, 117, 141, 164, 189, 214, 239, 263

Floricultural Œconomics, xi. 108, 184, 256

Florist's Magazine noticed, ii. 208, 210, 260

Flower-beds, best mode of filling, vii. 95, 119; plants intended for them should be prepared in pots, vii. 119; dung, cautious use of, for, xii. 95; moss, as a covering to prevent evaporation from, xii. 119; arrangement of, xiv. 161

Flower-buds, advantages of removing them in order to increase the future development, viii, 72, 96, 143

Flower Garden, plan of a, i. 154, 184; hints respecting, iv. 216, 240; plans and ornaments of, iv. 257, v. 136, 254; designs for, v. 136, 254 ; hints on the plants most suitable for, and their preparation, v. 255; hints for the, xii. 232; conditions suitable for the health and fertility of the plants, necessary to provide, xii. 233 ; the proper formation of beds, xii. 234; deep borders injurious, xii. 235; proper aspect for, xii. 236; plants, aptness of, to become dry in spring, previous to being planted out, xiii. 95; the propagation of, xiii. 160

Flower-gardening, xiv. 158

Flowering plants, rules for determining the merits of, vi. 66 ; means for inducing a more continuous development of their blossoms, vii. 96 ; the maturation of seeds debilitative to most of them, vii. 96; on disbudding them, x. 61, xiv. 113 ; trees, shrubs, and climbers, the pruning of, so as to produce uniform fructiferousness in every part, xiii. 23.

Flower-plots, the effect of, to observe, xii. 215 ; pots, improvements in, xii. 16 ; distinguished by numbers, ii. 20 ; improved kind of, v. 177

Flower-stand, ii. 23, 89; designed by Mr. Saul to form a pillar of roses, iii. 30; design for a new one, iv. 59

Flowers, flashes of light observed issuing from, ii. 193; solar light inimical to expanded, v. 183, 204 ; distinct organs, vi. 132 ; influence of heat in their production, vi. 132; suggestions for promoting their formation and development, vi. 134 ; their size, form, and colour, the chief criteria of beauty in plants, vi. 67 ; great differences in the mode of their production, vii. 119; shade useful in preserving them expanded, vii. 119 ; two kinds of beauty in them, vii. 145; importance of plucking decayed, viii. 143, ix. 107; treatment likely to produce them, ix 252; influence on colour of, xii. 8; on furnishing the parterre with in early spring, xiii. 66 ; what to employ, xiii. 66; treatment of those employed, xiii. 67; of Cereus grandiflorus, to prevent closing, xiv. 76

Flower-vase, design for a cast-iron, v. 64

Fluids, heat principally instrumental in the production of, vi. 35; the most rapid radiators of heat, vi. 86 ; heat always resident in, vii. 82 ; motion of in plants, noticed, xiii. 129

Flywort, triangular-lipped, iv. 17

Fogs in the neighbourhood of London, ii. 214

Foliage, functions of, xiv. 55

Folium petiolatum, xi. 261

Food of plants, iv. 15 ; prepared and supplied by heat, vi. 34 ; derived from the atmosphere, viii. 129 ; alkalies its principal source, viii. 154

Foramen, position and character of the, vii. 258; its nature described, ix. 10

Forbes' (Mr.) mode of propagating Cape heaths, by, i. 113; on exotic plants, ii. 13

Forcing, äerial system of, xiv, 154 ; flowers, time for commencing, v. 216; exposure to light necessary to plants intended for forcing, v. 192 ; flowers, hints on, vi. 24; houses, different modes of heating, i. 135 ; management of plants in, xi. 60 ; Pinks, &c., iv. 48 ; plants, chief peculiarities in the practice of, vii. 240, 264 ; plants, hints on, ix. 24, 72 ; plants, general principles to be regarded in, x. 264 ; time at which it should be commenced, viii. 216 ; Roses, &c., particulars most to be regarded in, viii. 208; novel plan for, viii. 211 ; Roses, xiii. 33 ; frame, xiii. 34 ; suggested improvement in, xiii. 34

Forests of North America, ii. 165; manner in which they affect the climate of any district, vi. 204

Forget-me-not, the white-flowered, a border-plant, xi. 112

Form, the science of, xi. 201

Forsythia viridissima, xiv. 67, 115, 188, xv. 209

Fountain, the Emperor, at Chatsworth, xi. 223 ; at Wilhelm's-hoehe, xi. 226 ; at St. Cloud, xi. 226 ; at Peterhoff, xi. 226 ; at Versailles, xi. 226 ; remarks on v. 9

Foxglove, where it should be grown, x. 30

Fragrant Crocus, iii. 263

Frame Plants, iii. 264

Frames, management of, v. 264 ; advantages of growing greenhouse plants in, vi. 201 ; excellent method of elevating, vi. 264; best adapted for growing Cactaceæ in through the summer, vii. 207 ; also for Pelargoniums at all seasons, vii. 33, 87 ; excellent method of covering them, vii. 88; plan for elevating them, and preserving them dry, vii. 88 ; best method of protecting, ix. 212 ; the use of them for growing plants in, economical, x. 182 ; substitutes for, xi. 71, 215 ; ventilation of, xi. 114

Francoa, ii. 24, 48, 72 ; sonchifolia, i. 254; culture of the genus, i. 235

Francisea Hopeana, i. 80 ; latifolia, viii. 260, ix. 73 ; its management, ix. 74 ; villosa, ix. 63 ; hydrangæformis, xi. 141 ; Pohliana, xi. 190 ; acuminata, xii. 239 ; *Pohliana*, 239 ; acuminata, xiii. 27 ; acuminate-leaved, xiii. 27 ; augusta, xiii. 189 ; hydrangeæformis, xiii. 43, 71, 121 ; hydrangea-like, xiii. 121 ; *Pohliana*, xiii. 27 ; gracilis, xiv. 262 ; hydrangeæformis, xiv. 68

Frankinsana, xv. 88

Fraxinella, xiv. 227

French and English roses to flower late, iv. 96

Friability of soil, iv. 11

Friesia peduncularis, xiii. 188

Frittillaria ruthenica, iii. 214

Frost, importance of guarding against autumnal, iii. 240, v. 215 ; mode in which it operates on plants, vi. 87 ; means for counteracting its effects, vi. 87 ; reason for its destructiveness of vegetation in spring, vi. 86 ; the growth and decay of vegetable matters suspended by it, vi. 34 ;

mode of remedying its effects, viii. 64.
Fruit, constituent parts of, vii. 258
Fuchsia globosa, ii. 75 ; culture of the genus noticed, ii. 85, 87, 192 ; Groomiana, iii. 262 ; discolor, iii. 165 ; macrostema, *var.* recurvata, iv. 17 ; large stamened, iv. 17 ; globosa, *var.* elegans, iv. 75, 212 ; Atkinsonia, iv. 190 ; globosa, iv. 191; arborea, dimensions of, in the open air, v. 12 ; fulgens, v. 17, 164 ; culture of, v. 222 ; method of protecting the genus, in the open ground, v. 251 ; cylindracea, well adapted for hybridisation, vi. 17; fulgens, suggestions for treating it as Dahlias usually are, vi. 46 ; further remarks on its culture, vi. 273 ; globosa, *var.* Devonia, vi. 237 ; corymbiflora, vii. 262 ; decumbens, vii. 188 ; fulgens, propriety of assigning it to a new genus, vii. 182 ; microphylla, its affinity with F. fulgens in the form of the corolla, vii. 183 ; Standishii, its combination of the characters of both its parents, vii. 183 ; characteristics of the original species of, vii. 183 ; instructions for hybridising, vii. 184 ; cordifolia, viii. 141 ; corymbiflora, viii. 7 ; general culture of, viii. 8 ; fulgens and its hybrids, plan of forcing, viii. 135 ; radicans, viii. 262 ; treatment of, viii. 131 ; well adapted for planting in a sheltered border, viii. 14, 134 ; propriety of pruning the dwarf species, viii. 133 ; cordifolia, ix. 99; treatment of, ix. 100; Laneii, ix. 167 ; Monypennii, ix. 117 ; radicans, ix. 27 ; culture of, ix. 28 ; alpestris, x. 47; exoniensis, x. 151 ; splendens, x. 21 ; best hybrid, described, x. 215 ; suggestions for disbudding, x. 62 ; general treatment of, x. 204 ; seedling, Smith's Queen Victoria, xi. 73 ; Standish's seedling, xi. 31; to obtain improved varieties of, xi. 32; for planting in masses, xi. 138 ; serratifolia, xii. 94, 169 ; saw-leaved, xii. 169 ; large-flowered, xiii. 94, 97 ; macrantha, xiii. 97, 140 ; serratifolia, xiii. 237 ; the, as a standard, xiii. 13 ; kinds of, very appropriate for forming standard, xiii. 16 ; advantage of training, xiii. 17 ; xiv. 23, 141 ; serratifolia, xiv. 135 ; dependens, xv. 22 ; loxensis, xv. 96 ; macrantha, xv. 258 ; spectabilis, xv. 142, 258
Fucus vesiculosus, iii. 42
Fuel, economic use of, iv. 57 ; remarks on, iv. 185
Fugosia hakeæfolia, xiii. 236 ; heterophylla, xiii. 69
Fumigation, destroying insects by, i. 24 ; with tobacco injurious to Orchidaceous flowers, viii. 96
Funaria hygrometrica, xii. 169
Functions of plants materially affected by heat, vi. 84
Funckia albo-marginata, v. 139, 211; Sieboldiana, v. 162
Furnaces, hints on the formation of, v. 62 ; management of, v. 264 ; Chanter's patent smoke-burning, ii. 245 ; Whitty's, ii. 248
Furze, as a standard, xi. 19

G.

Galactodendron utile, vi. 113
Galangale, round-rooted, i. 125
Galanthus, ii. 69
Galardia picta, iv. 131 ; coronata, ix. 167
Galeandra Baueri, vii. 211 ; new species of, vii. 166 ; Devoniana, viii. 145 ; xiii. 166 ; xiv. 49
Galipea, xiv. 224
Galphimia glauca, v. 236
Gandaria, xv. 158
Gangrene of stems of plants, ii. 47
Garcinia mangostana, xv. 205 ; cornea, xv. 206 ; morella, xv. 206; cambogia, xv. 206 ; amboinensis, xv. 207; dioica, xv. 206
Garden architecture, iv. 82 ; remarks on, viii. 107, 183, 231, 255
Garden chairs, figured, i. 123, 220 ; iv. 206
Garden implements, iii. 204
Garden mats, vi. 24, 274
Garden ornaments, vi. 19, 40
Garden pots, improvements in, x. 42, 84
Garden scenery, xiii. 177
Garden seats, ii. 71
Gardens, most instructive to a tourist, ix. 66
Gardeners, attention to trifles, xi. 256, 260 ; mental improvement, of, vi. 207, 230
Gardening as a science, articles on, ix. 9, 33, 57, 81, 105, 129, 153, 177, 201, 225, 249, xi. 9, 33, 57, 81, 105, 129, 153, 177, 201, 227, 249
Gardening, pleasures of, v. 153
Gardenia florida, i. 226 ; radicans, i. 227, ii. 24, 216 ; ii. 72, 120, 144, 168, 192, 240 ; v. 105 ; pannea, iv. 115 ; Rothmannia, vii. 21; Sherbourniæ, x. 238, xv. 23 ; Stanleyana, xii. 214 ; Devoniana, xiii. 262, 269 ; Duke of Devonshire's, xiii. 269 ; florida, *var.* fortuniana, xiii. 188 ; Lord Stanley's, xiii. 169 ; Stanleyana, xiii. 169 ; Fortuni, xiv. 117 ; longistyla, xiv. 213 ; malleifera, xiv. 140 ; nitida, xv. 21
Gardoquia Gillesii, iii. 18, 72 ; Hookerii, iii. 144, 243 ; multiflora, v. 210, vi. 223; betonicoides, vii. 262
Garland-flowered Rose Bay, iii. 117
Gas furnace, Witty's improved, recommended, i. 132 ; figured, i. 133
Gas stoves, their applicability to horticultural purposes, v. 80
Gases described, ix. 178 ; ix. 201, xiv. 130
Gasteria, ordinary culture of the genus, vii. 251
Gastrochilus pulcherrimus, vi. 213, vii. 75, 76, ix. 70; longiflora, x. 93
Gastrolobium cordatum, vii. 43 ; acutum, x. 213 ; villosum, xiv. 188, xv. 256 ; spinosa, xv. 256
Gastronema, ii. 69
Gate lodge for a country residence, i. 178
Gaultheria, i. 160, ii. 228 ; Shallon, i. 160
Gaybine, royal purple, ix. 243
Gaylussacia pseudo-vaccinium, xii. 19, 101, xv. 257
Geigera, xiv. 225
Gelasine azurea, vii. 41; almost hardy, vii. 41
Genista monosperma, iv. 19, 45, v. 21; bracteolata, vii. 89 ; monosperma, vii. 143; virgata, xi. 43; (Seline) Spachiana, xii. 260 ; *spinosa*, xiii. 236
Gentian quinqueflora, iii. 165
Gentiana gelida, vi. 189, vii. 5 ; 153 ; Pneumonanthe, vii. 154 ; acaulis, vii. 154 ; septemfida, viii. 51, xv. 232 ; verna, viii. 118 ; septemfida, *var.* caucasica, ix. 167
Geodorum, ii. 158, 183
Geometrical flower garden, plan of a, i. 154, 184
Geraniums noticed, iii. 216 ; tuberosum, *var.* ramosum, vi. 41 ; improperly confounded with Pelargoniums, vii. 33 ; rubifolium, vii. 19 ; erianthum, ix. 213
Gerardia delphinifolia, vi. 165 ; glutinosa, xiii. 70
Germination of seeds, ii. 114, vi. 85 ; phenomena of, ix. 10
Gesneria Suttoni, i. 13 ; Cooperi, i. 224 ; allagophylla, ii. 164 ; faucialis, ii. 24, 72, 260 ; oblongata, iv. 22 ; Selloii, iv. 27 ; faucialis, iv. 27 ; sceptrum, *var.* ignea, iv. 116 ; Lindleyi, iv. 210 ; Douglasii, *var.* verticillata, iv. 259 ; faucialis, v. 117; oblongata, v. 259 ; reflexa, v. 92, 117 ; rupestris, v. 53, 187 ; verticillata, v. 118 ; Douglasii, *var.* verticillata, vi. 29 ; Marchii, vi. 186 ; oblongata, vi. 104 ; stricta, vi. 163 ; treatment of the genus, vi. 30 ; cochlearis, vii. 66 ; mollis,

vii. 186 ; Arnoldii, viii. 166 ; bulbosa, viii. 187 ; mollis, viii. 243; new species of, viii. 190 ; zebrina, 238, 271 ; suggestions for disbudding, x. 65 ; caraccasana, x. 215; discolor, x. 68, 239 ; polyantha, x. 68, 239 ; Gardneri, xi. 262 ; macrorhiza, xi. 213 ; Schiediana, xii. 92 ; maculata, xii. 118 ; bulbosa, *var.* lateritia, xiii. 164 ; cordata, xiii. 287 ; elliptica, *var.* lutea, xiii. 164 ; Gerardiana, xiii. 55 ; merits of, xiii. 55 ; hondensis, xiii. 69 ; macrantha purpurea, xiv. 263 ; zebrina, xiv. 135 ; triflora, xv. 21 ; libanensis, xv. 142 ; hondensis, xv. 23
Gethellis, ii. 70
Gilia Achillæfolia, i. 150 ; aggregata, i. 27 ; pulchella, i. 27 ; tricolor, i. 150 ; tenuifolia, iii. 260
Gillies Gardoquia, iii. 18
Ginger, culture of, i. 200 ; mode of preparing the roots, i. 200 ; grass, xv. 237
Gladiolus, culture of the genus, i. 97 ; pudibundus, ii. 68, 192, 197, 240 ; natalensis, iii. 71 ; candidus and incarnatus, iii. 238 ; Mortonius, v. 210 ; ramosus, vi. 99 ; an open border most suitable for, vi. 100 ; insignis, vii. 224 ; treatment of, vii. 225 ; planting in the open ground in summer, vii. 224 ; gandiensis, x. 215, xi. 27 ; gandiensis superba, xiii. 190 ; brenchyensis, xv.
Glandular snapdragon, iii. 261
Glass, refraction of light by, v. 205 ; radiating and conducting power of, vi. 37 ; capacity for transmitting light and heat, vi. 11 ; for the roofs of plant-structures, description of that used at Chatsworth, vii. 253 ; usefulness of coloured, in germinating seeds, viii. 223 ; manner in which it affects light, x. 10 ; consideration of substitute for, xii. 58
Glazing, Mr. Saul's mode of, i. 130; Mr. Harrison's, i. 131; various objections to, i. 131
Globba nutans, xiii. 125 ; *sylvestris*, xiii. 125
Globe, everlasting, xi. 22
Gloriosa superba, i. 97, iii. 24, iv. 190, xiv. 109 ; Leopoldiana, xiv. 273
Glory trees, xiv. 16
Glossula, ii. 183
Gloxinia speciosa, ii. 76 ; caulescens, ii. 76 ; hirsuta, ii. 76 ; speciosa, iv. 24, 127 ; hybridising recommended, v. 219 ; maxima, v. 219 ; rubra, vii. 188, 271, 272 ; hybrid, xv. 239 ; albo-coccinea, xv. 169 ; Fyfiana, xv. 169 ; Feuchlein, xv. 169 ; digitaliflora, x. 189, 193 ; rubra, *var.*, x. 189 ; speciosa, *var.*, x. 189 ; rubra, x. 114 ; discolor, xi. 142 ; macrophylla, xi. 214 ; speciosa seedlings, xi. 199, 200, 211; tubiflora, xi. 142 ; Passinghamii, xii. 267 ; tubiflora, xii. 20 ; Mr. Passingham's, xii. 267 ; pallidiflora, xiii. 44 ; Fyfiana, xiv. 141; albo-coccinea, xiv. 273
Gluten, xi. 155
Glycine, ii. 36, 85, 87, iii. 72
Glycosmis, xiv. 185
Gmelina, xv. 214; Rheedii, xv. 214
Goat moth, figured, i. 48
Goat Orchis, xv. 33
Godetia lepida, iii. 118; rubicunda, iii. 143; vinosa, iii. 213
Golden-flowered Bartonia, iii. 69 ; Daubenya, iii. 19 ; Bartonia, iv. 18 ; flowered Chysis, iv. 68
Goldfussia anisophylla, ii. 112 ; glomerata, viii. 121 ; glomerata, ix. 121, xiv. 30 ; isophylla, xv. 117
Gompholobium polymorphum, v. 118, vi. 151, 116 ; versicolor, vi. 186 ; Drummondii, vii. 188 ; tenue, vii. 166 ; splendens, x. 189 ; Hendersoni, xi. 103, xv. 256 ; a new species of, xi. 214 ; ——— ? xii. 142 ; barbigerum, xii. 164, xv. 256 ; versicolor, *var. caulibus purpureis*, xii. 214, 219, 220, xiii. 188; venustum, xiii. 236, xv. 258 ; barbigerum, xiv. 221 ; bearded keeled, xiv. 221 ; new species, xiv. 117, 190 ; splendens, xiv. 142 ; *spe. nov.*, xv. 196
Gomphrena pulchella, xi. 22
Gongora atropurpurea, ii. 137 ; bufonia, viii. 19, ix. 19 ; truncata, xi. 118, xii. 239 ; maculata tricolor, xv. 21
Gonolobus diadematus, ii. 107, 109; hispidus, vii. 66
Goodyera, ii. 183
Goodenia grandiflora, xii. 116
Gooseberry blight, ii. 41, 42
Gopher Wood, xv. 212
Govenia, ii. 158 ; superba, ii. ; liliacea, v. 66 ; utriculata, xii. 92; fasciata, xiii. 22 ; pallida, iv. 70
Grabowskia Boerhaaviæfolia, iv. 209 ; duplicata, ix. 19, viii. 19
Gracillaria anastamosanis, xiv. 168
Grafting, modes noticed, i. 93 ; scientific principles of, iii. 230
Grafting Cactæ, v. 23, 69 ; Azaleas, v. 142 ; Camellias, Rhododendrons, &c., vi. 93, 111; trees, advantages of, vi. 65 ; principles of, vii. 202 ; objects to be attained by it, vii. 203 ; applicability of the practice to most hard-wooded exotics, vii. 205 ; most approved routine, vii. 203 ; new kind of handglass suitable for the purpose, vii. 203 ; clay or wax easily dispensed with, vii. 204 ; Cacti, improved method of, x. 162 ; to form standards by, xi. 18
Graham, Dr., on the water in the pitchers of Nepenthes, i. 58
Grammatophyllum multiflorum, vi. 217
Grammatotheca, xv. 9 ; *Finlaysonianum*, xi. 90
Grasses, selection for a lawn, ii. 66; external characteristics of, vii. 39
Great Hook-tip Moth, xiv. 72 ; flowered Ixora, iii. 75
Greenhouse, cost of fitting up, i. 130, 137 ; plants, xv. 13, 240, 256 ; climbers, choice selection of, xv. 85 ; Chatsworth, ii. 81, iii. 96, 114, 120, 144, 216, 240 ; hints respecting, iv. 72 ; propagation of, iv. 144, 192 ; additional hints on, iv. 216 ; a method of arranging during summer, iv. 237; remarks on watering, &c., iv. 240, v. 24, 48, 72, 95, 119, 144, 169, 192, 216, 239, 263 ; time for potting, v. 48 ; varied effects of light upon, v. 155 ; advantages of dividing a collection of, according to their habits, v. 180, 182 ; benefited by a removal to the open ground in the summer months, v. 213 ; climbing plants, the partial acclimatation of, vi. 159, 249
Greenhouses, substitution in them of thin canvass for glass during fine weather, vi. 202 ; only calculated for display, vi. 201 ; plants, remarks on exposing them during the summer, vi. 119 ; method of inducing them to flower freely, vi. 156 ; vii. 24, 47, 71, 96, 120, 144, 168, 192, 216, 239, 264, viii. 120, ix. 120, x. 192, 216, xiv. 33
Greenovia aurea, xi. 116
Green and white Ornithogalum, iii. 144
Green-tubed Cooperia, iii. 119
Green Man Orchis, xv. 32
Grevillea rosmarinifolia, iv. 47 ; Manglesii, vi. 44 ; dubia, vii. 115 ; longifolia, vii. 93
Griffinia, culture of the genus, i. 233 ; hyacinthina, vi. 44, xi. 238 ; xii. 171 ; intermedia, xiii. 237
Griffin's Lissochilus, iv. 25
Grobya Amhersti, ii. 139
Grottoes, directions for forming, v. 230 ; proper position and construction of, viii. 138, ix. 139
Ground cistus rhododendron, iii. 169
Ground, mischievous consequences of trampling, in wet weather, xi. 257

Ground-work, advantages of the early completion of, xi. 47, 257; proper seasons for performing different kinds of, xi. 257

Grouping of trees, shrubs, &c. xiii. 179

Growth of plants, a result of the application of heat, vi. 33, 34, 84 ; a distinct process from the production of flowers, vi. 132 ; why, when luxuriant, it is inimical to fertility, vi. 133

Guano, in connection with floriculture, xii. 201; description of true, xii. 201; condition of, as imported, xii. 201; analysis of, xii. 202; all decomposable appliances of all vegetables contain, xii. 203 ; to employ, great caution required, xii. 203

Guara-like Clarkia, iv. 90

Guava, culture of the, i. 119, iv. 39

Guayaquil Thorn Apple, iv. 90

Guelder Roses, should not have their young shoots pruned, vii. 23

Guernsey Lily, iii. 192

Gum Arabic, xv. 89, 153

Gunnia picta, vi. 92

Gustavia Augusta, xiv. 83

Gymnadenia conopsea, xv. 32

Gymnonychium, xiv. 227

Gymnostomum truncatulum, xv. 253

H.

Habenaria, ii. 158, 183 ; Goodyeroides, ii. 79 ; procera, iii. 167 ; bifolia, xv. 32

Habits of plants susceptible of alteration, vi. 84, 158

Habranthus, ii. 69 ; pratensis, ix. 95, 121 ; how to cultivate, ix. 122 ; *var.* quadriflora, ix. 190 ; concolor, xii. 239

Habrothamnus purpureus, xii. 46 ; fasciculatus, xii. 118 ; *cyaneus*, xii. 92, 213 ; *elegans*, xi. 187, 236 ; purpureus, xi. 236 ; corymbosus, xiii. 22 ; fasciculatus, xiii. 84 ; cluster-flowered, xiv. 193 ; corymbosus, xiv. 112, xv. 210 ; elegans, xiv. 69, 193 ; fasciculatus, xiv. 69, 112, 193

Hæmanthus, ii. 68 ; tenuiflorus, *var.* mozambicensis, viii. 116

Hakea ferruginea, ii. 209, xi. 184 ; florida grown in the open air, v. 12 ; saligna, naturalisation of, v. 12

Halesia, ii. 228

Half-hardy plants, merits of, i. 55 ; time for repotting those that are exposed, i. 215 ; plants, propagation of, v. 168, 255 ; plants, suggestions for propagating, vi. 72, 167, 191 ; period for transplanting, vi. 95 ; plants, time and method of transplanting, vii. 95; propagation of, vii. 167, 192 ; plants, proper way of planting them, viii. 96, 120 ; perennials, remarks on propagating, ix. 24, 168 ; their preservation through the winter, ix. 209

Hand-book of Plain Botany, noticed, ii. 94

Handglass, description of improved, ii. 208

Handsome herbaceous plants, xv. 259

Haplophyllum, xiv. 227

Hardenbergia digitata, vii. 235 ; Comptoniana, viii. 27; method of cultivating, viii. 28; macrophylla, viii. 267 ; treatment of, viii. 268 ; appropriate situations for, xii. 112

Hardening tender plants in autumn, importance of, x. 216, 240

Hardy Annuals to be sown, iv. 48 ; shrubs, season for pruning and propagating, i. 72, 167, 191 ; double flowers, list of, with their culture, i. 133; herbaceous plants, errors in trimming, vii. 48 ; directions for separating and shifting, vii. 48, 150

Hare-lipped Epidendrum, iii. 215

Harpalyce fulvata, xiv. 167

Harrison's Mimulus, iv. 173

Haworth, A. H., Esq., division of the genus Narcissus, i. 118 ; cultivation of the genus, . 251

Hawthorn hedges, recommendation to graft the more ornate kinds of Cratægus upon, vi. 65

Heart's Ease, i. 116 ; properties of a good one, i. 117 ; practice of washing the roots of, v. 207, xi. 144, 168, 192

Heat and light, xiv. 127, 128

Heat, application of, xiii. 9 ; means of economising, v. 13, 80, 253, 274 ; its influence on vegetable life, functions, and substances, vi. 33, 59, 107, 132, 155, 181, 204 ; suppositions as to its nature, vi. 33 ; its expansive power, vi. 34 ; perfectly imponderous, vi. 34; its sources, vi. 36 ; its agency in the geographical distribution of plants, vi. 59 ; its modification by elevated tracts or large bodies of water, vi. 181 ; also by trees and forests, vi. 204 ; generated by all living things, vii. 81 ; abstracted by winds, vii. 81 ; dispersed in the process of evaporation, vii. 82 ; its connexion with fluids, vii. 82 ; manner in which it escapes during evaporation, vii. 82 ; its radiation and conduction, vii. 131 ; laws which govern its transition, vii. 131 ; that of an artificial kind inimical to the hardihood of seeds ripened or plants germinated therein, vii. 136 ; way of testing the last circumstance, vii. 137; beneficial to the roots of plants, viii. 209 ; philosophy and uses of bottom, x. 156 ; its theory and practical application, xii. 9 ; application of, xii. 33

Heating by hot water, cost of, i. 134 ; Mr. Saul's mode, i. 136 ; houses, merits of different modes of, x. 33 ; apparatus, xi. 114 ; apparatus, description of, xii. 10 ; defects of systems of, xiii. 81 ; history of different methods of, xiii. 82 ; merits of, by hot water, xiii. 83 ; Polmaise plan of, alluded to, xiii. 12 ; hothouses, xiv. 253

Heathery, suggestions for the formation of a, ix. 229

Heaths ; culture of the Cape species, i. 113 ; natural habitats of some, i. 236 ; drooping roundheaded, v. 65 ; green-tipped, v. 65 ; a separate house advantageous to, v. 156 ; causes of ill success in the cultivation of, v. 156, 204 ; method of renovating sickly plants of, v. 215 ; superb three-coloured, vi. 3 ; Banks's, vii. 243 ; Mr. Macnab's, vii. 125 ; great attention now bestowed on, vii. 125, 243; proper situation for placing them in, vii. 244 ; Mr. Macnab's treatise on them recommended, vii. 126 ; points in the management of, viii. 150 ; moor soil not indispensable to the hardy kinds, viii. 40 ; Dr. Neill's, ix. 196 ; hints on growing, ix. 196 ; admirably fitted for planting in beds or groups, ix. 183 ; leaf-mould beneficial to, x. 138 ; advantages of cutting down old specimens, x. 258 ; Mr. Murray's, xi. 77 ; for planting in groups, xi. 138 ; for winter gardens, xi. 253 ; the Duke of Devonshire's, xiii. 3 ; xiv. 135

Heath-soil, means of ascertaining the quality of, viii. 36 ; constituents of various specimens, vii. 84 ; necessity of exposing it before use, viii. 130; considerations on, vii. 249 ; on the uses of, for fine-rooted plants, xi. 65 ; fittest method of employing, xi. 66 ; substitutes for, xi. 66, 185

Hebecladus biflorus, xii. 260

Hedge nettle, scarlet, xv. 261

Hederoma latifolia, vi. 259

Hedwig, M., definition of a plant by, i. 32

Hedychium, hints on the cultivation of, iv. 201 ; angustifolium, iv. 202 ; aurantiacum, iv. 203 ; carneum, iv. 203 ; elatum, iv. 203 ; flavescens, iv. 203; flavum, iv. 202 ; Gardnerianum, iv. 203 ; gracile, iv. 203 ; heteromallum, iv. 203 ; longifolium,

&c., &c., 204 ; aurantiacum, vii. 213

Heimia salicifolia, *var.* grandiflora, viii. 260

Heinsia jasminiflora, xiii. 22

Heister's Muraltia, iv. 150

Helianthemum, the species suited for grouping, ix. 234 ; cultivation of, iv. 183

Heliotropium Peruvianum, culture of, iii. 29 ; incanum, xii. 214 ; hybridum Voltaireanum, xiv. 239

Helichrysum macranthum, v. 141, 164, 247, 257, 260 ; culture of, v. 248 ; robustum, vii. 188 ; niveum, viii. 99 ; its culture, viii. 100 ; the genus noticed, iii. 115

Heliophila trifida, xii. 142; pinnata, xiv. 219 ; trifida, xiv. 20, 215, 219

Hellebore, Corsican, v. 233

Helleborine, xv. 32.

Helleborus lividus, v. 233 ; olympicus, ix. 238 ; orientalis, ix. 142

Hemerocallis Sieboldii, v. 25 ; speciosa, vi. 214

Hemisandra aurantiaca, xii. 127

Henchman's Chorizema, iv. 233

Henfreya scandens, xiv. 92, 140, xv. 96

Henna, xv. 213

Hepaticas recommended for the flower-garden in winter, 256

Herbaceous plants cut down, iii. 96 ; directions for supporting, v. 96 ; effects of frost on such as are planted in autumn, vi. 24 ; on removing the flowers of, ix. 96 ; a few species of, for decorating the flower-beds in winter, xi. 255

Herbertia cærulea, viii. 93 ; Drummondi, xiv. 186

Hereman's Vegetable Dilutium, useful for destroying the mealy bug, 240

Hermaphrodite flowers, their nature, vii. 232

Hermium Monorchis, xii. 32

Hermodactylus longifolius, i. 242 ; culture of the genus, i. 241

Heterodendron, xiv. 228

Heterotoma, xv. 9

Heterotropa asaroides, vi. 185

Heydesarum onobryitris, the presence of it an indication of calcareous soil, iv. 9

Hibbertia perfoliata, xi. 22

Hibiscus Lindlei, i. 77 ; ficuloides, i. 77 ; mutabilis, i. 77 ; racemosus, i. 77 ; culture of the genus, i. 77 ; syriacus variegatus, ii. 3, 228 ; splendens, iii. 147 ; Rosa sinensis, iii. 205 ; lilacinus, v. 15 ; Cameronii, vi. 237 ; multifidus, vii. 103 ; remarks on the management of, vii. 104 ; Cameronii, viii. 3 ; instructions for growing, viii. 4 ; Cameroni-fulgens, xi. 116 ; Jerroldianus, xiii. 1 ; requirements of, xiii. 2 ; Mr. Jerrold's, xiii. 1 ; moscheutos, xiv. 67 ; palustris, xiv. 67 ; *var.* xv. 167

Hierochloa borealis, xv. 237

Hills, cases in which they are suitable or unsuitable for planting tender species upon, vi. 182 ; less visited by frosts than low situations, viii. 36 ; and more proper for planting tender plants upon, viii. 37

Hilum, its form noted, vii. 258

Hindsia longiflora, xi. 142, 197 ; violacea, xi. 142, 197 ; method of managing, xi. 198 ; longiflora alba, xii. 142 ; longiflora, xiv. 142 ; longiflora alba, xiv. 142 ; *spe. nov.*, xv. 23

Hints on Flower-gardening, xiv. 158

Hippeastrum breviflorum, iv. 66 ; ambiguum longiflorum, v. 165 ; anomalum, vii. 69

Hippobroma longiflora, xv. 9

Hobo, xv. 38

Hoeing ground, the utility of, xi. 258 ; assists to retain moisture in the soil, xii. 143

Hofali, xv. 139

Hogg on soils for flowers, i. 9

Hog Plum, xv. 38

Hoitzia Mexicana, vi. 261 ; *coccinea*, xi. 238, xii. 263

Holbollia latifolia, xiii. 212

Hollies, proper time to plant, i. 46, 120, 144

Honeysuckles, on training them singly to poles, viii. 182 ; on training them, and forming them into standards, x. 209 ; various modes of treating them, x. 210 ; planted in masses, and kept dwarf, xi. 138

Hookeria lucens, xii. 160 ; *coronaria*, xii. 221

Hop plant, its use for ornamental purposes, ix. 89

Horkelia fusca, iv. 233

Horned Oncidium, iii. 143

Hortia, xiv. 225

Horticultural Society of London, ii. 28

Horticulture, its claims to be considered a science, vii. 129

Horticultural School, suggestions respecting a grand central, viii. 9

Horticultural exhibitions, xv. 143, 167 ; science, xv. 104

Hosackia stolonifera, iv. 188

Hothouses, remarks on heating, ii. 53, 100, 237 ; on the construction and heating of, ii. 244 ; probable expense of erecting, ii. 256 ; roofs, construction of, ii. 80 ; on the climate of, iii. 223 ; temperature of, iii. 264

Hotiea barbata, vii. 211

Hot-water apparatus, i. 134—6 ; heating by, ii. 53, 100 ; boiler, plan of a new one, iii. 103 ; apparatus, iv. 33 ; its advantages over steam in heating plant-houses, v. 57 ; apparatus, management of, v. 57 ; pipes, most suitable size for, v. 60 ; tank, reasons for employing, to heat houses, xii. 252 ; plan of, xii. 253

Houlletia Brocklehurstiana, viii. 215, xiv. 117

House for striking cuttings, i. 111 ; for the growth of both plants and fruits, ii. 186

Hovea Celsi, iii. 241 ; Manglesii, v. 257 ; fungens, vi. 71, 101 ; treatment of the genus, vi. 102 ; villosa, vii. 69 ; new species of, x. 70 ; Celsii, hints for managing, x. 115 ; pungens, *var.* major, x. 51 ; treatment of, x. 52 ; racemulosa, x. 21 ; splendens, x. 70, 103 ; how to grow it, x. 104 ; ilicifolia, xi. 262 ; trisperma, xi. 94 ; linear-leaved, xii. 75 ; linearis, xii. 75 ; point in the cultivation of, requiring attention, xii. 75 ; linearis, xv. 258

Hoya, ii. 107—9 ; coriacea, vi. 89 ; coriacea, hints respecting the culture of, vii. 21 ; *trinervis*, xii. 165 ; xiii. 263 ; campanulata, xiii. 237 ; imperialis, xv. 142, 214 ; bella, xv. 243 ; Cunninghamii, xv. 264

Hugelia, xiv. 225 ; lanata, xv. 118

Humidity, when accompanied by a sufficient heat, grateful to the human feelings and to plants, vii. 120

Humus, general nature and properties of, vii. 10, 57 ; its nature investigated, viii. 81 ; not exhausted by vegetables, viii. 130 ; in soils, increase of, xi. 230, 249 ; nature of its offices, in the nutrition of plants, xi. 249 ; a source of carbonic acid, xi. 250

Huntleya meleagris, vi. 69 ; violacea, vi. 141 ; violacea, viii. 1 ; its treatment, viii. 2 ; meleagris, x. 189

Hunt's patent garden-pots described, x. 89 ; Mr., on solar light, xv. 58

Hyacinthus, culture of, ii. 8 ; selection of five sorts, ii. 8 ; history of, ii. 8 ; to grow in glasses, ii. 11 ; forcing, ii. 11 ; growing in pots, ii. 11 ; in sand, ii. 11 ; diseases of, ii. 11 ; propagation, ii. 11

Hyacinths, treatment of in pots and glasses, i. 41 ; Madame Mermone, and Helicon, iii. 71 ; to be looked over, iii. 216 ; 264 ; on raising species, iv. 208 ; principal features in the culture of, vii. 24, 240 ; method of starting them into growth, ix. 240 ; hints

for growing them in the open air, x. 240
Hyacinth-pot, new, xii. 17 ; new method of fastening connected with, xii. 17
Hybrid Corræas, xiv. 147
Hybridisation, remarks on, v. 219; of half-hardy plants, hints on the, vi. 192 ; of ornamental trees, its importance, vi. 65 ; good consequences of, vii. 79 ; observations on extending the practice to annuals, vii. 143 ; of native plants, remarks on the, ix. 87 ; for improving their properties, ix. 87 ; for rendering delicate species more hardy, ix. 87 ; theory of, xi. 202, xiv. 147
Hybrid plants, injudiciousness of applying names to them unless they are distinct, vii. 3 ; commonly require much pruning, vii. 11; readily obtained between species of allied genera, vii. 51 ; justness of allowing the gardeners who raise them part of the profits derived from their sale, vii. 196
Hydrangea hortensis, culture of, iii. 13, 144, 192 ; hints on watering, v. 120 ; hortensis, its treatment as a border flower, ix. 40 ; on disbudding, x. 61; hortensis, probable cause of the change of colour in the flowers of, x. 177, 225 ; japonica, x. 119 ; hortensis, suitable for planting in groups, xi. 138; japonica, xi. 262 ; several species of, xi. 262; japonica, xii. 119 ; japan, xii. 119 ; japonica, *var.* cærulea, xiii. 212 ; the blue, xiii. 109 ; azisai, xiv. 165 ; japonica variety, xiv. 141
Hydrogen gas, characteristics of, ix. 227
Hydrolea spinosa, xii. 142, xv. 258; spinosa, xiii. 247; its suitability for the flower-garden, xiii. 247 ; spiny, xiii. 247; *trigyna*, xiii. 247
Hydrotænia meleagris, ix. 165
Hylotoma pilicornis, xiv. 70 ; rosæ, xiv. 71
Hymenæa Courbaril, v. 236
Hymenoxys californica, vii. 235
Hypericum calycinum, well fitted for planting in groups, ix. 234 ; for shrubberies, xii. 60; for covering banks, xii. 62
Hypnum proliferum, xii. 160
Hypocalymma robustum, x. 68, xv. 239
Hypocalyptus obcordatus, viii. 212
Hypocyrta strigillosa, x. 238; discolor, xii. 142, xiii. 68; strigillosa, xiii. 117; leucostoma, xiv. 164
Hypsela, xv. 9
Hyssop of the ancients, xv. 252
Hyssopus orientalis, xv. 252 ; officinalis angustifolius, xv. 254 ; caucasica, xv. 254

I.

Ice, a result of radiation, vi. 35
Illicium floridanum, hints on, iii. 63 ; anisatum, iii. 63 ; parviflorum, iii. 63, 192 ; floridanum, v. 147 ; religiosum, ix. 213
Illustration, highly useful in botanical pursuits, vii. 36
Impatiens scapiflora, iv. 163, 237, v. 101, 238 ; glanduligera, vii. 90, 214 ; macrochila, vii. 41 ; tricornis, vii. 42 ; candida, viii. 93 ; rosea, viii. 117 ; platypetala, xiv. 20 ; repens, xv. 239
Importance of early planting, iii. 9
Importation of plants, suggestions respecting the, vi. 61
Imported seeds, directions for the germination and subsequent management of, vi. 62
Impregnation, iii. 120 ; philosophy of the process of, ix. 9 ; of seeds, philosophy of the, xi. 202
Improvement in the construction of forcing-houses, iii. 157 ; in gardens, advantages of designing them in the early part of the autumn, v. 191
India, preparation and management of plants during a voyage from, i. 263
Indian azaleas, different ways of treating, xi. 160
Indian cress, Mr. Moritz's, viii. 199 ; edible rooted, ix. 127 : azure-flowered, ix. 247; many-leaved, x. 175 ; Mr. Lobb's, xi. 271 ; showy, xiv. 173
Indian daffodil, i. 149
Indigenous plants, methods of improving, ix. 84 ; by soil, ix. 85 ; by yearly shifting and division, ix. 86; by hybridisation or seeds, ix. 87
Indigofera, ii. 228; Dosua, ix. 239 ; stachyoides, x. 69 ; decora, xii. 214, xiv. 240, xv. 257
Indusium of plants, nature of the, vi. 58 ; difference between the part so called by Mr. Main, and that of the majority of botanists, vii. 257
Inflorescence, various forms of, vii. 119, 161; structure and economy of, xi. 201
Inga pulcherrima, xi. 147 ; suitable mode of culture, xi. 148 ; sensitive properties of the leaves of, xi. 148 ; Harrisii, vi. 185
Insects, a knowledge of their forms and habits useful to gardeners, vi. 231 ; injury done to leaves by, ii. 40, iii. 120 ; which infest stove plants, modes of destroying them, v. 71 ; necessity for timely destroying, ix. 192 ; infesting flowers, xiv. 167, 179, xv. 168
Iochroma tubulosa, xii. 92
Iodine, effects of, on seeds, ii. 114
Ionopsis tenera, iv. 18 ; utricularioides, v. 211
Ipomœa, ii. 107, 109 ; rubra cærulea, iii. 99 ; Horsfalliæ, iii. 50 ; iv. 70, 94; bonariensis, v. 161 ; platensis, v. 234; Leari, vi. 237 ; culture of, vi. 268 ; pungens, vi. 261 ; rubro-cærulea, distinction between it and I. Leari, vi. 267; longifolia, vii. 90 ; batatoides, viii. 163 ; ficifolia, viii. 68, 238 ; Hardingii, viii. 142; Leari, principal points of the growth of, viii. 204 ; tyrianthina, viii. 73, 263 ; its culture, viii. 74 ; ficifolia, ix. 25 ; plan of treating, ix. 26 ; rubro-cærulea, *var.* ix. 117; Tweedieii, xi. 261 ; cymosa, x. 117 ; Leari, excellent mode of propagating, x. 185 ; crassipes, xi. 43 ; Hardingii, xi. 217 ; how to obtain good specimens of, xi. 218 ; Krusensterni, xi. 213 ; macrorhiza, xiv. 67 ; muricata, xiv. 116 ; pulchella, xiv. 140
Ipomopsis elegans, i. 27 ; picta, i. 245 ; culture of the genus, i. 28; elegans, ii. 168, 216 ; picta, ii. 168, 216 ; elegans, culture of, iv. 24, 96, 229
Iris bifolia, i. 245 ; culture of the genus Iris, i. 82 ; uses of, i. 83 ; alata, iii. 215 ; chinensis, iv. 71 ; fragrans, vii. 18 ; bicolor, vii. 214, ix. 29 ; culture of, ix. 30 ; persica, x. 77 ; how to grow, x. 78 ; imbricata, xii. 164 ; setosa, xiv. 67 ; aurea, xiv. 272, xv. 234
Irish Farmers' and Gardeners' Magazine, noticed, ii. 148
Iron inferior to wood for the roofs of plant-houses, v. 34 ; its presence in soils made known by the action of fire, vii. 251; in heath-soil, not injurious to plants, viii. 84
Irritability of plants, i. 31, 54
Ismelia Madeirensis, iii. 213
Ismene Amancaes, iii. 267 ; Amancaes sulphurea, i. 96 ; Macleana, v. 210 ; virescens, viii. 43
Isochilus carnosæflora, xi. 213 ; carnosiflorus, xii. 263
Isolated trees, hints on planting, viii. 159
Isomeris arborea, viii. 20
Isopogon Baxteri, iv. 20 ; scabra, x. 213, xiv. 258
Isotoma axillaris, iii. 48, xv. 9 ; breviflora, xv. 9 ; longiflora, xv. 8
Ivy, beauty and use of, ii. 185 ; remarks on growing it in detached specimens upon lawns, and on its various uses, x. 16

Ixia Heleri, i. 8 ; flexuosa, i. 8 ; viridiflora, i. 8 ; tribe, hints on the culture of, iii. 64; examination of the bulbs, iii. 48, 168 ; to be encouraged, iv. 120 ; new species, xiv. 215
Ixiolirion montanum, xii. 20
Ixora Bandhuca, ii. 265 ; grandiflora, iii. 75 ; acuminata, xi. 190; odorata, xii. 261 ; *Brunonis*, xii. 261 ; coccinea, xiv. 41 ; crocata, xiv. 41; hydrangeæformis, xiv. 165 ; Griffithii, xiv. 214 ; javanica, xiv. 215, 265 ; odoratissima, xv. 239; *spe. nov.* xv. 240

J.

Jabaticarburas, xv. 64
Jabaticata, xv. 64
Jaborosa integrifolia, iii. 141
Jaca tree, iii. 254
Jacaranda tomentosa, xii. 217 ; tomentosa, xii. 217 ; to obtain dwarf-flowering specimens, xii. 218; *pubescens*, xii. 217; mimosæfolia, xi. 151; most approved plan of management, xi. 152; to obtain dwarf-flowering specimens of, xi. 152
Jack, Dr., pitcher of Nepenthes examined by, i. 58
Jacksonia grandiflora, vi. 237
Jacobea Lily, i. 149
Jacquemontia canescens, xiv. 116
Jambon, xv. 64
Jambosa vulgaris, xv. 60; amplexicaulis, xv. 63 ; aquea, xv. 63; cauliflora, xv. 64; densiflora, xv. 64; formosa, xv. 64; lineata, xv. 64; malaccensis, xv. 63 ; macrophylla, xv. 64 ; sylvestris alba, xv. 64
Jambu, xv. 63
Jamrosade, xv. 60
Jasmines, greenhouse species, ii. 35, 85, 87; stove species, ii. 107, 108; privet-leaved, v. 15
Jasminum glaucum, v. 15 ; multiflorum, vii. 22 ; caudatum, ix. 116; Reevesii, ix. 215 ; affine, xii. 116; dianthifolia, xiii. 117; nudiflorum, xiii. 212, 273 ; arborescens, xv. 174; bracteatum, xv. 174 ; dispersum, xv. 174; elongatum, xv. 174; fragrant oil from, xv. 174; gracilis, xv. 174; grandiflorum, xv. 174 ; heterophyllum, xv. 175 ; lancifolium, xv. 175 ; latifolium, xv. 175; nudiflorum, xv. 23, 173, 209 ; officinalis, xv. 175 ; pubescens, xv. 175 ; revolutum, xv. 175 ; sambae, xv. 175; scandens, xv. 175 ; simplicifolium, xv. 175 ; trinervum, xv. 175
Jesse, E., Esq., mode of planting large trees by, i. 46
Johnsonia hirta, vii. 44
Jollifia africana, culture of, iv. 58
Jonesia, ii. 85, 87
Juanulloa parasitica, xi. 236; observations upon, xii. 65
Jungius, M., definition of a plant by, i. 32
Juniperus lycia, xv. 89
Justicia coccinea, i. 102, ii. 120; venusta, xi. 213; *flava*, xi. 210; xii. 263 ; Macdonelliæ, xii. 263; *glabrata*, xii. 243 ; *gangelica*, xiii. 187 ; semperflorens, xiii. 117 ; carnea, xiv. 23, 239 ; carthaginensis, xiv. 263 ; coccinea, xiv. 134 ; gangetica, xiv. 125 ; new species, xiv. 93 ; speciosa, xiv. 134

K.

Kæmpferia elegans, vii. 189 ; rotunda, i. 125
Kalmia, propagation of, iii. 47, 24; forcing, v. 216 ; latifolia, eligibility for planting in groups, xi. 138; for standards, xi. 19
Kalosanthos splendens, iii. 237, xv. 64
Karaka, xv. 141
Karpaton hastatum, xiv. 249
Kaulfussia amelloides, viii. 195 ; ordinary culture of, viii. 196
Keith, Mr., definition of a plant by, i. 32
Kennedia rubicunda, i. 88; coccinea elegans, ii. 99, 186; Marryattæ, ii. 260; selection of, ii. 85; splendens, iii. 26; glaberata, iii. 93 ; bracteata, iii. 114 ; sericea, iii. 114; coccinea, iii. 114 ; Comptoniana, iii. 114; monophylla, iii. 114; ovata, iii. 114; Stirlingi, iii. 117; macrophylla, iii. 165; dilatata, iii. 192 ; nigricans, iv. 21 ; Marryattii, iv. 22; glaberata, v. 92; new species of, vii. 93 ; pannosa, vii. 17; Stirlingii, vii. 69; monophylla, *var.*, xi. 94
Khardal, xv. 187
Kikanqu, xv. 64
King Leopold Phlox, xiv. 267
Kittelia, xv. 12
Knight, Mr., experiments made with Dionœa muscipula by, i. 61
Knight, T. A., Esq., extracts of a letter from, on the course of sap, vi. 9
Kopsia fruticosa, xiii. 69
Kreysigia multiflora, viii. 261
Kumquat, xv. 165
Kupa, xv. 64

L.

Labels for plants made of rolled zinc, i. 155, 183 ; of lead, i. 124
Labichea bipunctata, x. 150, 151
Labisia pothoina, xii. 214
Laburnum, example of one with various-coloured flowers, ix. 132
Lacæna bicolor, xi. 211, xv. 191
Lacticiferous tissue, office of, xi. 107
Ladies' Botany reviewed, ii. 115
Lælia anceps, ii. 79, 139 ; iv. 73 ; Barkeriana, iv. 90 ; albida, vi. 235 ; anceps, vi. 22 ; autumnalis, vi. 121 ; furfuracea, vi. 114, vi. 122 ; purpurascens, vii. 214 ; albida, vii. 189 ; cinnabarina, vii. 94, 193 ; history and culture of, vii. 194 ; succeed best on blocks of wood, vii. 194 ; may be slightly exposed in autumn, vii. 192 ; rubescens, vii. 164 ; acuminata, x. 49 ; mode of cultivating, x. 60 ; flava, ix. 117, 262 ; majalis, xi. 140 ; peduncularis, xi. 165 ; superbiens, xi. 97 ; way to treat, xi. 98 ; the May-flower, xii. 1 ; majalis, xii. 1 ; native habitat of, xii. 1 ; difficult to cultivate, xii. 2 ; probable explanation of cause, xii. 2 ; method of treatment deserving attention, xii. 2 ; cinnabarina, xiv. 116 ; majalis, xiv. 142 ; superbiens, xiv. 47 ; Mr. Perrin's, xiii. 5 ; Perrenii, xiii. 5 ; major, xiii. 263; peduncularis, xiii. 22; flava, xv. 71
Lagerstrœmia elegans, xiv. 209, 269 ; general culture, xiv. 210; grandiflora, xiv. 209 ; indica, xiv. 209, 269 ; parviflora, xiv. 209 ; reginæ, xiv. 210 ; speciosa, xiv. 210
Lalage ornata, vii. 94 ; hoveæfolia, ix. 117, 171 ; its treatment, ix. 172
Landscape gardening, how to obtain a knowledge of, vi. 232 ; instructions in, vi. 82 ; different styles of, ix. 138 ; its connexion with other arts, ix. 138
Lance's Oncidium, iv. 169
Language, precision in its use of great moment in botanical matters, vii. 111, 161
Lankesteria parviflora, xiii. 70
Lantana Selloi, iii. 168 ; iv. 214 ; Selloiana, *var.* acutifolia, ix. 116; crocea, x. 53 ; its culture, x. 54 ; mutabilis, xiii. 238; a fine flower-garden plant, xiii. 238 ; Selloi, xiii. 238 ; for the flower-garden, &c., xiii. 238
Lapeyrousia anceps, iv. 18
Laplacea semiserrata, xii. 20
Large-flowered Coryanthus, iii. 95
Large-leaved Kennedia, iii. 165
Largest Megaclinium, iv. 117
Larkspur, slender-branched, iv. 41, 216 ; sapphire blue variable, v. 233 ; Mr. Barlow's, v. 265 ; double-flowered Chinese, vii. 171
Larpent's Lead-wort, xiv. 271
Lasiandra petiolata, vii. 19 ; *Kunthiana*, xii. 125
Lasthenia glabrata, ii. 209; iv. 45
Lateral growths, the necessity of removing them early to obtain upright developments, xi. 17
Lathyrus, ii. 36; magellanicus, iii.

213; nervosus, x. 21; pubescens, x. 69
Latje, xv. 84
Laurentia, xv. 10
Laurestinus, as a standard shrub, xi. 19
Laurus cinnamomum, iv. 103; indica, dimensions of a naturalised plant of, v. 12
Lavender recommended as an ornamental plant, ix. 234
Lawsonia alba, xv. 213
Layering the orange, i. 92
Layering, iii. 120; v. 240; probable origin of the practice of, vii. 201; proper time for, vii 23; modes of, ix. 105; a means of inducing dwarfness, xi. 41
Leaf-mould for exotics, x. 133; its preparation, x. 138; description of, xii. 227
Leaves, wounds of, ii. 38; the sleep of, iv. 232; an abundance of them an indication of the necessity of a large supply of solar light, v. 112; structure of, vi. 81; venation of, vi. 84; functions of, vi. 153, 177, 251; substances produced in, vi. 153; defining the natural orders, vii. 113; value of the manure which decayed ones furnish to the trees or shrubs that shed them, vii. 263
Leaves, multiplication of plants by, ix. 83; their value to plants, x. 154; as a source of bottom-heat, x. 161; influence of light on some, x. 11; functions of, xiv. 55
Lebretonia, close proximity of the genus to Pavonia, v. 256
Lee Chee, xv. 84
Leguminosæ, ii. 112, 260
Leianthus longifolius, xiii. 29; why interesting, xiii. 29; long-leaved, xiii. 29; umbellatus, xiii. 164; nigrescens, x. 238; longifolius, xii. 164, 191; black-flowered, xiv. 149; nigrescens, xiv. 149
Lemon grass, xv. 238
Lemonia spectabilis, vii. 235, x. 189, xiv. 224; showy, xiv. 224
Lemon-coloured Oncidium, iv. 77
Lemon tree, time of introduction of the, i. 88
Leonotis nepetæfolia, vi. 18
Lepanthes tridentata, ii. 113; sanguinea, xi. 211
Lepismium commune, vi. 257; myosurus, vi. 233
Leptosiphon androsaceus, iii. 142, 219; densiflorus, iii. 220; androsaceum, densiflorum, iv. 133, 136
Leptospermum bullatum, xv. 167
Leptotes bicolor, ii. 139; concolor, ix. 22
Leschenaultia arcuata, xiii. 263; splendens, xiii. 213; arcuata, xiv. 246; culture of, xiv. 110; oblata, xiv. 47; splendens, xiv. 190, 245; xv. 254, 267; formosa, improved by grafting, xii. 114; on the grafting of, xii. 114
Leucadendron argenteum, xiv. 63
Leuchtenbergia Principis, xv. 214
Leucochilum maxillare, xv. 21
Leucocoryne alliacea, xi. 101; its culture, xi. 101
Leucojum, ii. 69
Leucopogon, culture of the genus, i. 53; juniperoides, xv. 22
Leucothoe floribunda, iv. 101; hardihood of, v. 94; valuable for planting in masses, xi. 138; pulchra, xiv. 188
Leycesteria formosa, vi. 18; formosa, excellent for planting in beds, ix. 235; formosa, xiv. 250
Liatris propinqua, vii. 236; borealis, v. 27, iv. 213
Libanus thurifera, xv. 90
Liber, origin and application of the phrase, vi. 57
Lichen and Moss gardens, xii. 156; some account of, xii. 157
Lichens and Mosses, their interesting nature, xii. 156; list of where found, &c., xii. 158; suitable situation for the growth of, xii. 159
Liebigia speciosa, xiii. 237, xiv. 188
Life, tenacity of, in plants, vii. 136
Light, flashing from flowers, ii. 193; its influence on plants, v. 110, 131, 155, 179, 203; artificial, its operation on flowers, vi. 11; its effects on plants, viii. 223; possibly the cause of all electrical phenomena, viii. 224; its presence universal, viii. 225; the source of colour, viii. 225; its general influence on vegetation, x. 9; consideration of, xii. 57, 249; its influence upon plants, xii. 57; upon the colour of flowers, xii. 60; xiv. 127; agency of, xv. 57
Lightning conductors, practicability and advantage of employing for the protection of glass erections, xiii. 249
Lign Aloes, xv. 43
Ligustrum japonica, xiii. 142
Lilac Beauty Moth, xiv. 168
Lilac Slender Moth, xiv. 168
Lilac tree, insects on, xiv. 168
Lilacs, impropriety of reducing the branches of, vii. 23
Liliaceæ, new, i. 98, ii. 211, 262
Lilies, general culture of the Japan species, vi. 128, 189
Lilio-Narcissus Jacobeus, i. 149
Lilium album, iv. 211; peregrinum, iv. 42; speciosum (lancifolium rubrum), iv. 191; superbum, &c., iv. 190; aurantiacum, v. 189; lancifolium album, v. 188; roseum, v. 188, 267; speciosum, v. 1, 273; aurantiacum, vi. 127; lancifolium roseum, vi. 189; Thunbergianum, vii. 166; atrosanguineum, *var.* maculatum, viii. 190; eximium, remarks on, viii. 128; speciosum, *var.* album, viii. 127; directions for growing it to the greatest perfection, viii. 158, xv. 143; testaceum, ix. 215; speciosum, x. 215; testaceum, x. 69, 221, 222; Thompsonianum, xii. 20; *varieties*, xii. 215; sanguineum, xiii. 213
Lily of the valley, for forcing, iii. 24
Lily, culture of the Japan species of, viii. 128, 158
Limax alba, xiv. 70; agrestis, xiv. 70
Lime, present in the sap of the grape-vine, vii. 130; in its natural state, xi. 228; water, xiv. 104
Limnanthes Douglasii, iv. 66, 133
Limnocharis Humboldti, i. 121
Limodium longifolium, xii. 241
Limodorum tuberosum, ii. 146
Limonia citrifolia, xiv. 183
Lindleya mespiloides, xi. 116
Linnæa borealis, xiv. 250
Linnæan system of botany, relative value of the, vi. 129, 225, 228
Linnæus, Dr., definition of a plant by, i. 32; observations on the pitchers of Nepenthes, i. 57; on Dionæa muscipula, i. 60
Linum Berendieri, iii. 116; trigynum, vi. 22, xi. 51, xiv. 134
Liparia parva, *var.* angustifolia, x. 187
Liquid manures, xi. 111, xiv. 102
Lisianthus Russellianus, v. 17, 189, 260, vi. 31; the temperature of a stove requisite for, vii. 14; a decided perennial, vii. 14; fittest system of training, vii. 15; its propagation, vii. 16; mode of preserving through the winter, viii. 226, x. 189; hints on disbudding, x. 64; glaucifolius, xi. 238, xii. 70; *exaltatus*, xii. 70, xiii. 99; *glaucifolius*, xiii. 99; *longifolius*, xiii. 29; *umbellatus*, xiii. 164; acutangulus, xiv. 214; nigrescens, xiv. 150
Lissochilus, ii. 159; speciosus, iv. 25, 94; parviflorus, v. 68; macranthus, xi. 43; roseus, xi. 43
Listeria cordata, xv. 33; ovata, xv. 33
Literary composition, its importance to gardeners, vi. 209; directions for acquiring adroitness in, vi. 209
Lithospermum Canescens, xv. 151, 189
Loam, mode of testing the adhesiveness of, vii. 255; constituents and varieties of, viii. 34, 154, x. 58, xi. 228; formation of, xi. 228; requisites in, xi. 186; to

improve the texture of, xi. 185 ; perfect, xii. 226
Loasa lateritia, its treatment in the open border, v. 42, 77, 78, 118, vi. 252 ; characteristics of the natural order, vi. 226 ; Pentlandica, viii. 142 ; Herbertii, ix. 7, 167, 269, 270 ; Pentlandica, ix. 7, 8 ; volubilis, ix. 167 ; lucida, xi. 214
Lobelia fulgens propinqua, ii. 52 ; culture of the genus, iii. 120, 155 ; decurrens, iii. 93 ; Cavanillesii, iv. 210 ; erinoides, iv. 233 ; percicifolia, iv. 21 ; polyphylla, iv. 65 ; siphilitica hybrida, iv. 210 ; Bridgesii, v. 185 ; Cavanillesii, v. 118 ; Drummondii, v. 238 ; fenestralis, v. 210 ; heterophylla, v. 15, 238 ; heterophylla, vi. 198 ; ignea, vi. 165, 248 ; Milleri, vi. 166 ; ramosa, vi. 166 ; new species, vii. 119 ; Tupa, vii. 214 ; heterophylla major, ix. 101, 102 ; Erinus, *var.* grandiflora, x. 75, 76, xv. 260 ; longiflora, x. 190 ; fulgens, *var.*, xi. 214 ; thapsoidea, xii. 92 ; *cornuta*, xiii. 149 ; glandulosa, xiii. 44 ; *spectabilis*, xiii. 149 ; *sphærocarpa*, xiii. 149 ; *surinamensis*, xiii. 149 ; cælestis, xiv. 273, xv. 103, 259 ; braziliensis, xiv. 273 ; fulgens multiflora, xiv. 260, xv. 7 ; pyramidalis, xiv. 263, xv. 7 ; Marryattæ, xiv. 263, xv. 7 ; *var.*, xv. 7, 240 ; inflata, xv. 8 ; urens, xv. 8
Locust Tree, culture of, iv. 143
Lodge for the gate entrance to a country residence, iv. 178
Lœlia anceps, v. 20 ; anceps Barkeriana, v. 21 ; autumnalis, v. 236
Lœligia ornata, v. 92
Loeselia coccinea, xi. 238 ; *mexicanum*, xi. 238
Lomatia ilicifolia, *var.* pinnatifida, x. 143
Lomatia tinctoria, xi. 211
Lombardy Poplars, not adapted for standing alone, viii. 162
London fogs, ii. 214
Longan, xv. 84
Long-leaved Dryandra, iii. 171
Long-spiked Dendrobium, iii. 167
Long-tailed Angræcum, iii. 119
Lonicera, ii. 35, 229 ; angustifolia, xv. 165 ; diversifolia, xi. 140 ; xiv. 250 ; discolor, xiv. 188
Lopezia lineata, vii. 164
Lophospermum rhodochiton, ii. 27, 264 ; culture of the genus, ii. 36 ; scandens, iv. 233, v. 63, 259 ; treatment in the open border, vi. 251, viii. 253 ; erubescens, *var.* spectabile, viii. 75, 76
Lopimia malacophylla, xv. 118
Loquat, culture of, iv. 111
Lord Anson's Pea, iii. 213
Lorey's Bell Flower, iii. 117
Lotus corniculatus flore pleno, ix. 215
Loudon's Arboretum et Fruticetum Britannicum, strictures on, vii. 134
Loudon, the late Mr., xi. 48
Lozotænia rosana, xiv. 72 ; operana, xiv. 72 ; lævigana, xiv. 72
Lucas's self-acting force and lift-pump, i. 156
Luculia gratissima, iii. 114, iv. 21, 273, v. 21, ix. 22 ; method of treating, xi. 231 ; severe pruning recommended for, xi. 232 ; cultivation in pots, xi. 232 ; in conservatory borders, xi. 233 ; wood-ashes and charcoal useful to, xi. 234 ; xv. 23 ; Pinceana, xii. 20
Lukshmee, xv. 158
Lupinus Texensis, iii. 142 ; latifolius, iii. 260 ; versicolor, iv. 188 ; Cruikshankii, iv. 190 ; Barkerii, vi. 234 ; Hartwegii, vi. 138 ; leptocarpus, vii. 164 ; season for staking, vii. 120 ; arvensis, xi. 43 ; pubescens, xi. 214 ; observations of the treatment of a few species of, xi. 179 ; planted in masses, xi. 180 ; as isolated specimens, xi. 181 ; ramosissimus, xii. 117
Luxemburgia ciliosa, x. 190, 261, xi. 3, 4
Lycaste plana, x. 165 ; Skinneri, xi. 1, 2, xv. 47 ; a new species of, xi. 142 ; gigantea, xii. 141 ; fulvescens, xii. 261
Lychnis grandiflora, ii. 1 ; coronata, ii. 1 ; Bungeana, iii. 166, iv. 235 ; mutabilis, x. 190
Lycium Afrum, iii. 71 ; fuchsioides, xii. 70
Lycopodium stoloniferum, useful for protecting the roots of Orchidaceæ, vi. 266 ; denticulatum, for growing on baskets filled with Orchidaceæ, ix. 91
Lyda hortulana, xiv. 71
Lyonia, ii. 92 ; jamaicensis, xiv. 20
Lyperia pinnatifida, xii. 166
Lysimachia lobelioides, ix. 20
Lysinema, culture of the genus, i. 53
Lysionotus albidus, xiii. 139 ; longiflorus, xiii. 273, xiv. 190
Lysipoma, xv. 9

M.

Mackie's Echinocactus, iv. 68
Macleania longiflora, xi. 117 ; angulata, ix. 262 ; cordata, xv. 191
Mac Nab on planting evergreens, ii. 222
Macrochilus, xv. 12
Macromeria exserta, xiv. 116
Macrostylis, xiv. 227
Madam, hardy Rose, iii. 17
Madeira, Vines in, xv. 106
Maderia Ismelia, iii. 213
Madia elegans, iv. 42
Magnesia, xv. 250
Magnetism, xiv. 128
Magnolia odoratissima, iii. 72, xiii. 213 ; *pumila*, xiii. 213
Magnolias, ii. 35, 229
Mahogany, an interesting account of, iv. 160
Mahonia glumacea, vii. 55, 56 ; aquifolium, ix. 5, xi 254
Major, Mr. Joshua, hothouse apparatus by, ii. 60
Malachodendron, ii. 230 ; clavatum, xv. 21 ; ovatum, xv. 209
Malaxis, ii. 184
Malay Apple, xv. 63
Mallow, showy red-flowered, vi. 16, 55
Malope trifida, i. 177 ; trifida grandiflora, i. 177
Malpighia urens, xv. 78 ; glabra, xv. 78
Malvaceæ, ii. 261
Malva Creeana, iv. 119 ; Munroana, iv. 165, 269 ; purpureum, iv. 191 ; Towardii, v. 141, 235 ; Creeana, vi. 16, 55 ; campanulata, vii. 118 ; purpurata, vii. 186 ; Creeana, viii. 228 ; lateritia, viii. 20 ; campanulata, ix. 173, 174 ; Creeana alba, x. 190 ; campanulata, xv. 259
Mammillaria atrata, v. 65 ; floribunda, v. 90 ; Lehmannii, v. 43 ; tenuis, v. 90 ; v. 23, 69 ; treatment of the genus, vii. 260 ; pycnacantha, ix. 239 ; turbinata, x. 21 ; tetracantha, xi. 23
Management of stove plants, xiv. 205
Mandevilla suaveolens, vii. 42 ; planted out in a conservatory, vii. 42
Mandragora autumnalis, iii. 93
Manettia cordifolia, ii. 267 ; culture, ii. 85, 87, 267 ; glabra, ii. 267 ; bicolor, x. 23, xii. 84, xiv. 135 ; iii. 192
Mangifera indica, xv. 156 ; domestica, fœtida, sylvatica, mangautai, glauca, macrocarpa, oppositiflora, merian, xv. 158
Manglesia purpurea, vi. 259
Mango, xv. 156
Mangosteen, xv. 205 ; Cowa, Celebes, Amboyna, xv. 206
Man Orchis, xv. 32
Manuleā pinnatifida, xii. 166
Manures and Composts considered, iv. 255 ; means for dispensing with, v. 239 ; character and offices of, viii. 129, 153 ; philosophy of, x. 105, 129 ; economising, xi. 108 ; in a liquid state, xi. 111 ; period of applying, xi. 259 ; xii. 132, 133, 249 ; experiment upon, xii. 134 ; suitable

for Roses that have been forced, xiii. 36 ; xiv. 102
Marcellus Tulip, iii. 19
Marcet, M., experiments on poisons, i. 32
Marcetia excoriata, x 165
Marcgraavia, i. 60
Marianthus cæruleo-punctatus, viii. 190, 247 ; new species of, viii. 262
Marica Sabini, i. 81 ; cærulea, i. 128 ; Northiana, i. 81 ; semi-aperti, i. 81 ; gracilis, vi. 68 ; humilis, *var.* lutea, vii. 165
Marnock, Mr., cultivation of stove ferns, i. 171; on exposing plants, xv. 178
Marsdenia maculata, xiv. 116
Marshallia cæspitosa, vi. 17
Martynia, xiii. 190 ; diandria, iv. 259 ; fragrans, viii. 20, x. 269, xiv. 38 ; lutea, xi. 149, 150
Masdevallia infracta, v. 117; fenestrata, xii. 141
Massing, on employing the Chinese Rose for, xiii. 41
Massonia lutea, iii. 19
Mastacanthus sinensis, xiii. 44
Mastic Tree, xiv. 34, xv. 89
Mathiola, culture of, ii. 29
Mats, as covering to plant-houses, vi 109
Maturation of wood indispensable to fertility, vi. 157
Maurandia Barclayana, ii. 36, 86 ; vi. 252 ; white-flowered, ix. 273
Maxillaria, culture of the genus, i. 228, ii. 138, 268 ; Harrisoniæ grandiflora, ii. 196 ; Deppei, ii. 268 ; tetragona, ii. 78 ; cristata, crocea, picta, densa, Warreana galeata, Barringtoniæ, ii. 139 ; aromatica, iii. 168 ; cristata, iii. 19, iv. 132 ; Rollissonii, iv. 213 ; Stapelioides, iv. 213 ; Steelii, iv. 117 ; aurea-fulva, v. 18 ; graminea, v. 163 ; Rollissonii, v. 186, 260 ; Stapelioides, v. 163; tenuifolia, v. 141 ; aureo-fulva, vi. 22 ; lentiginosa, vi. 190 ; tenuifolia, vi. 42 ; vitellina, vi. 69; cucullata, vii. 42 ; aromatica, *var.*, viii. 118 ; citrina, viii. 119 ; acutipetala, ix. 213 ; Harrisoni alba, x. 190; Steelii, x. 70; Æanthina, x. 190; *Heynderycxii*, xii. 141 ; macrobulbon, xiii. 115 ; Warreana, xiii. 141 ; clavata, xv. 118
Meadow-sweet, bearded, v. 15
Mealy Bug, xiv. 95, 107
Mechanism of plants, xi. 178
Medullary processes, origin of, xi. 36, 131
Medinilla erythrophylla, x. 79, 80 ; speciosa, xiv. 214
Meek, Mr., death of, xiv. 155 ; mode of heating by, xiv. 155
Megachile centuncularis, xiv. 71 ; ligniseca, xiv. 71
Megaclinium maximum, iv. 117 ; velutinum, xiv. 140
Megenia corymbosa, xiii. 22 ; fasciculata, xiv. 193
Melanthium triquetrum, xiv. 94
Melastoma sanguinea, xii. 269, xi. 238
Melicope, xiv. 225
Melocactus depressus, v. 256 ; culture of the genus, vii. 206
Melolontha vulgaris, xiv. 71
Mental improvement of gardeners, vi. 207, 239
Mentzelia stipitata, v. 119 ; viii. 86
Menziesia, ii. 9
Merendera caucasica, v. 258
Meriam, xv. 158
Mesembryanthemums, planting out, v. 120 ; cultivation of, v. 129 ; light necessary for, v. 134 ; propagating, vii. 250 ; almost hardy, vii. 138
Mespilus japonica, xiv. 34
Metallic poisons, effects on vegetation, i. 32
Metals, imperfect radiators, but rapid conductors of heat, vi. 36
Meteorology and temperature, xiv. 127
Metrodorea, xiv. 225
Metzlera, xv. 10
Mice, to destroy in the flower-garden, i. 24
Microsetia ruficapitella, ii. 213, xiv. 71; sericiella, xiv. 72
Microstylis histionantha, xi. 187
Mignonette, ii. 5, 144, 168, ii. 7, iii. 24, 168, iv. 48, 144, 168, 192, xi. 19, xiv. 135
Mildew, causes of, and means for removing, on heaths, v. 158
Millar, Mr., hot-water apparatus at the nursery of, ii. 65
Miltonia spectabilis, iv. 212, 234 ; candida, v. 236 ; spectabilis, v. 164 ; candida, vi. 241, 242, *var.* flavescens, vii. 90 ; Clowesii, vii. 214 ; Russelliana, vii. 217, 218 ; spectabilis, vii. 97, 98, 189 ; traits of the genus, vii. 98 ; spectabilis, x. 190 ; cuneata, xi. 70, 94, xv. 71, xii. 45 ; spectabilis, xiii. 44, xv. 215 ; Clowesii, xiv. 239 ; candida, xiv. 273, *spe. nov.*, xv. 215, 240
Mimosa prostrata, remarks on, iv. 93
Mimulus roseus, i. 29 ; Smithii, i. 54 ; origin of, i. 79 ; variegatus, i. 79 ; floribundus, i. 29 ; parviflorus, i. 29 ; rivularis, i. 30 ; moschatus, i. 29 ; irritability of stigma noticed, i. 29 ; culture of the genus, i. 29 ; Wheeleri, iii. 214 ; cardinallis, iii. 197 ; culture of, iii. 14 ; sanguineus maculatus, iv. 119, iv. 24 ; luteus, *var.* Wilsoni, iv. 260 ; cardinalis variegatus, iv. 133 ; Harrisonia, iv. 173; moschatus, method of filling up beds of roses with, vii. 14 ; in a common flower-border, viii. 88 ; Seymouriana, ix. 118 ; Maclainianus, ix. 46, 147 ; ix. 72
Mina lobata, ix. 93
Minorca Virgin's Bower, iii. 142
Minorca Box, for small flower-beds in winter, xi. 253
Mirbel, M., definition of a plant by, i. 32
Mirbelia floribunda, viii. 70, 103, 104 ; grandiflora, ix. 118
Miscellaneous greenhouse plants, remarks on the construction of a house for, v. 181
Mitraria coccinea, xv. 143, 147, 210
Moisture, consequences of a superabundance of, to plants, v. 207 ; quantity to be regulated by the temperature, vi. 48, 133 ; the cause of a demand for fire-heat in winter, x. 231
Mombin, xv. 38
Monachanthus viridis, ii. 78 ; discolor, ii. 139, iv. 71 ; singular facts respecting the genus, v. 258 ; Bushnani, vii. 201 ; longifolius, vii. 212 ; roseo-albidus, vii. 115 ; Bushnani, viii. 261
Monnieria, xiv. 225
Monolopia major, viii. 20
Monopetalæ, character of, vii. 231
Monopsis, xv. 10
Moon, abstraction of heat by the, vi. 37
Morenoa, ii. 109
Morina longifolia, vii. 139, xi. 141, 234
Morisia hypogæa, ii. 164
Mormodes atropurpurea, iii. 167 ; pardina, viii. 236 ; *var.* unicolor, viii. 140 ; atropurpurea, ix. 23 ; lineata, ix. 118, 190 ; aromaticum, x. 261 ; luxatum, x. 165 ; roseo-alba, x. 71 ; luxatum, xii. 142 ; Cartoni, xiii. 44 ; aromatica, xiv. 142
Morna nitida, iv. 67, vi. 141 ; nivea, v. 42
Morphology disclaimed, xi. 201, 204
Moths injurious to flowers, xiv. 71, 168
Mountain Larkspur, iv. 67
Mountains, varied temperature and vegetation of, according to their elevation, vi. 181
Mucuna, iii. 20 ; pruriens, v. 89, 119
Mule Pink, directions about, ii. 144
Mulgedium macrorhizon, xiii. 70, xv. 260
Muraltia Heisteria stipulacea, iv. 149, xii. 263
Murphy, Mr., remarks on the Sarracenia by, i. 33
Murucuja aurantia, xii. 44 ; *mollissima*, xiii. 25
Musa sapienta, ii. 93 ; paradisiaca, ii. 93 ; Cavendishii, iii. 51 ; coccinea, iii. 61 ; rosacea, iii. 59 ;

sapientum, iii. 57 ; paradisiaca, iii. 56 ; remarks on the genus, iii. 53 ; superba, viii. 43 ; xiv. 90
Musical dial fountain, description of, i. 259
Mussænda macrophylla, xii. 142, 197 ; frondosa, xiii. 118 ; macrophylla, xiii. 115
Mustard tree, xv. 185 ; Egyptian, xv. 185 ; Persian, xv. 185 ; Oriental, xv. 185 ; shrubby, xv. 185
Mutisia, ii. 107, 109 ; ilicifolia, xv. 101
Myanthus barbatus, ii. 124 ; cernuus, ii. 139 ; deltoideus, iv. 17, 70 ; cristatus, curious account of, iv. 90, v. 258 ; spinosus, vii. 140
Myclocarpum, ii. 92
Myoporum serratum, xii. 93
Myosotis azorica, xi. 263, xv. 260 ; palustris, for flower-beds, xi. 113
Myristica, moschata, culture of, iv. 178
Myrrh, xv. 138
Myrtles, iii. 23
Myrtus, xix. 34; Pimenta, remarks on, iv. 175

N.

Names of plants, xi. 51
Napoleana imperialis, xv. 189
Narcissus, culture of the genus, i. 117; flowered Ismene, iii. 267 ; hybrid, x. 187 ; fly, xiv. 168
Nardostachys Iatamansi, xv. 162 ; grandiflora, xv. 162
Nardus, xv. 161
Nasturtium, Sir J. Smith's, xv. 70
Natal corn flag, iii. 71
Native countries of plants, a knowledge of, essential to the cultivator, xi. 60
Natural habits of plants, v. 113
Natural orders, vii. 40, 258, 259
Natural system of Botany, vii. 36, 111, 161, 231, 257, xi. 129, 177, 225, 228
Natural mode of training climbers, xi. 207
Naturalising plants, v. 12, viii. 13, 37, 60
Nature and offices of earths and soils, iv. 9
Nature, importance of studying, vii. 206, 226 ; modifications of, vii. 71, 225
Neapolitan violet, xiii. 90 ; shade necessary, xiii. 90
Nelumbiums, culture of, ii. 110, iii. 96 ; speciosum, ix. 21; caspicum, xi. 91 ; luteum, xi. 233
Nematanthus longipes, x. 166 ; chloronema, xi. 91
Nemesia floribunda, v. 161, viii. 190
Nemophila insignis, iii. 117, 151 ; aurita, iii. 164 ; atomaria, iv. 67; insignis, iv. 70, 133 ; atomaria, culture of, v. 100 ; insignis, hardihood of, viii. 180 ; discoidalis, x. 262 ; maculata, xv. 264
Neottia, ii. 159, 184 ; speciosa, xi. 46
Nepenthes distillatoria, i. 54, 57, 58 ; culture of, iv. 1, xiii. 142
Nephelium longan, xi. 165, xv. 85 ; Litchi, xv. 85 ; verticillata, xv. 86 ; Lappaceum, xv. 86 ; informe, xv. 87
Neptunia plena, xiii. 44
Nerine sarniensis, iii. 192 ; culture of, viii. 86
Nerium thyrsiflorum, iii. 73 ; remarks on the genus, iii. 232
Nerium oleander splendens, ix. 82 ; oleander, *var.* Rayanot, xi. 53, 54, 96, xiv. 34
Nervous system in plants, i. 31
New Holland plants, mode of naturalising, v. 12
New, rare, or interesting plants, v. 19, 67, 91, 117, 139, 163, 187, 211, 235, 259, vii. 17, 20, 40, 44, 66, 68, 88, 91, 114, 116, 139, 141, 163, 166, 184, 187, 210, 213, 234, 236, 260, 261
New plants, their true character often imperfectly known, vii. 199
Nicotiana rustica, xiv. 201 ; Tabacum, xiv. 201
Nierembergia intermedia, ii. 219 ; Phœnicea, *var.* rosea, iv. 16 ; pink-flowered, iv. 16
Night air, prejudicial to tender exotics, vii. 192, 228
Nightshade, jasmine-like, viii. 5
Niouttout, xv. 140
Niphæa oblonga, viii. 263, ix. 273
Nispero, xv. 107
Nitrogen, means of detecting, viii. 56, 105 ; modes of fixing it in manures, x. 129
Noble-flowered Begonia, iv. 233
Noble Stanhopea, iii. 95
Nolana, a new species of, xi. 190 ; see *Alona ;* atriplicifolia, iv. 189
Nordmannia cordifolia, xiii. 118
Notices of new and rare plants, iv. 21, 69, 94, 118, 131, 165, 189, 211, 237, 261, 273
Notice of a few species in one or two genera in Crassulaceæ, xiii. 208
Novelty, effects of, in gardening, xi. 15
Nutmeg, culture of, iv. 178
Nuttallia cordata, iv. 67, 165; grandiflora, iv. 165, 190, 217, 235, v. 236 ; size to which it attains, vii. 32 ; malvæflora, vii. 31 ; treatment, vii. 32 ; cordata, xi. 237 ; malvæflora, xi. 190 ; papaver, xi. 173, 174
Nutrition of plants, philosophy of, xi. 227
Nuytzia floribunda, xi. 259
Nymphæa cærulea, heat beneficial to, viii. 112 ; rubra, xi. 190, 266 ; failure in cultivating, xi. 267 ; dentata, xiii. 236 ; new species, xiv. 263 ; Victoria, xiv. 23

O.

Oak seedling, grown in water, xi. 179 ; curious circumstance respecting, v. 10 ; germinating in water, ix. 34
Observation, great importance of, v. 204
Octomeria graminifolia, i. 156
Odontoglossum maculatum, vii. 116 ; grande, viii. 49, 50 ; pulchellum, viii. 190, 213 ; citrosmum, x. 22 ; læve, xi. 165 ; pulchellum, xi. 188 ; new species, xii. 118; Cervantesii, xii. 164, 193, 194 ; citrosmum, xii. 166 ; cordatum, xiii. 147, 148 ; membranaceum, xiii. 141; cuspidatum, xiv. 118 ; grande labellum album, xiv. 273 ; hastilabium, xiv. 20 ; Warneri purpuratum, xiv. 92 ; Maxillare, xv. 21; pulchellum, xv. 71
Œnothera, i. 86 ; uses of, i. 87 ; culture, i. 87 ; peculiarities in, i. 87 ; fruticosa, *var.* Ambigua, iv. 41; bifrons, iv. 135 ; fruticosa, *var.* indica, viii. 43
Oils, fixed vegetable, xi. 156
Olax, ii. 107, 108
Old and ornamental plants, vii. 21, 70, 101, 123, 127, 147, 149, 219, 221, 245
Oldenlandia Deppeana, xii. 263
Oleander, xii. 229, 230, 231 ; xiv. 34
Olibanum, xv. 89
Olive-green aphis, xiv. 96
Olive Tree, culture of the, i. 253
Onagraceæ, essential characteristics of, vii. 182
Oncidium bifolium, i. 234 ; culture of the genus, i. 233 ; citrinum, ii. 113, 127, 139 ; Lemonianum, ii. 262 ; crispum, iii. 166 ; Lanceanum, iii. 238 ; divaricatum, iii. 4 ; Russellianum, iii. 71 ; altissimum, iii. 144 ; cornigerum, iii. 143 ; ampliatum, iv. 45 ; lunatum, iv. 66 ; pulchellum pictum, iv. 70 ; citrinum, iv. 77 ; papilio, iv. 118 ; divaricatum, altissimum, iv. 119 ; pumillum, iv. 137 ; ornithorhynchum, iv. 166 ; crispatum, iv. 42 ; cebolleti, iv. 44 ; luridum, iv. 45, 71, 95 ; iridifolium, iv. 19, 95 ; leucochilum, iv. 21, 213 ; Lanceanum, iv. 21, 95, 133, 166, 169, 170, 236 ; low temperature preferable, v. 83 ; Henchmannii, v. 20, 237 ; Lanceanum, v. 163, 237 ; papilio, culture of, v. 176 ; pulchellum, v. 164 ; ramosum,

v. 68 ; raniferum, v. 210, 237 ; Russellianum, v. 259 ; deltoideum, vii. 262 ; hastatum, vii. 190 ; Huntianum, vii. 140 ; leucochilum, vii. 241, 242 ; pachyphyllum, vii. 165 ; pubes, vii. 70 ; Insleayii, viii. 142, 265, 266 ; longifolium, viii. 119 ; macrantherum, viii. 20 ; monoceras, viii. 188 ; ornythorhynchum, dark-flowered, viii. 263; Wrayæ, viii. 43 ; Lemonianum, ix. 273 ; microchilum, ix. 273 ; bicallosum, x. 69, 71 ; microchilum, x. 118 ; uniflorum, x. 187 ; bicolor, xi. 23 ; concolor, xi. 142 ; papilio, a superior variety of, xi. 70 ; a new species of, xi. 190 ; tricolor, xii. 21 ; bicallosum, xii. 93 ; spilopterum, xii. 164 ; incurvum, xii. 2, 6 ; iridifolium, xii. 166, xiii. 166, 273 ; concolor, xiii. 118; lacerum, xiii. 116; oblongatum, xiii. 190 ; phymatochilum, xiii. 118 ; unguiculatum, xiii. 263 ; Barkeri, xiv. 97 ; citrosmum, xiv. 142 ; concolor, xiv. 118 ; lacerum, xiv. 47 ; Mr. Barker's, xiv. 97 ; new species, xiv. 165, 215 ; amictum, xv. 21 ; curtum, xv. 21; tenue, xv. 118 ; *spe. nov.* xv. 191; spilopterum, xv. 200 ; pelicanum, xv. 21

On congruity in landscape gardening, xiii. 253, 254, 255, 256 ; employing Chinese Roses for massing, xiii. 41; furnishing the parterre with flowers, xiii. 66 ; growing Ipomœa, rubro-cærulea, and Pharbitis Learii in the open air, xiii. 84 ; growing plants as epiphytes, xiii. 17 ; plants to flower late in autumn, xiii. 112, 114

Onobrychis radiata, xiv. 189

On the cultivation of Cacti in moss, iii. 250 ; Viola odorata, *var.* pallida-plena, iii. 249 ; Pepper and of Rice, iii. 253

On the Myrtle tribe of plants, iii. 129

On the treatment of annuals, xiii. 61

Operations in 1834, for February, i. 23 ; Mar. i. 39 ; Ap. i. 75 ; May, i. 100 ; June, i. 223; July, i. 148; Aug. i. 172; Sep. i. 196; Oct. i. 219 ; Nov. i. 244; Dec. i. 266.—1835, Jan. i. 274 ; Feb. ii. 24 ; Mar. ii. 48 ; Ap. ii. 72 ; May, ii. 88; June, ii. 119; July, ii. 144 ; Aug. ii. 167 ; Sep. ii. 167; Oct. ii. 216 ; Nov. ii. 240; Dec. ii. 264.—1836, Jan. ii. 270; Feb. iii. 23 ; Mar. iii. 47 ; Ap. iii. 72 ; May, iii. 95 ; June, iii. 120 ; July, iii. 144 ; Aug. iii. 168 ; Sep. iii. 192 ; Oct. iii. 216 ; Nov. iii. 240 ; Dec. iii. 264.—1837, Jan. iii. 274 ; Feb. iv. 23 ; Mar. iv. 48 ; Ap. iv. 72 ; May, iv. 96; June, iv. 120 ; July, iv. 144 ; Aug. iv. 168; Sep. iv. 192 ; Oct. iv. 216 ; Nov. iv. 239 ; Dec. iv. 264.—1838, Jan. iv. 274 ; Feb. v. 24 ; Mar. v. 47 ; Ap. v. 71; May, v. 95 ; June, v. 119; July, v. 143; Aug. v. 167 ; Sep. v. 191 ; Oct. v. 215 ; Nov. v. 239 ; Dec. v. 263. —1839, Jan. v. 274 ; Feb. vi. 23 ; Mar. vi. 47 ; Ap. vi. 71; May, vi. 95 ; June, vi. 119 ; July, vi. 143; Aug. vi. 167; Sep. vi. 191; Oct. vi. 215 ; Nov. vi. 239 ; Dec. vi. 263.—1840, Jan. vi. 274 ; Feb. vii. 23 ; Mar. vii. 46 ; Ap. vii. 71; May, vii. 95 ; June, vii. 119 ; July, vii. 143 ; Aug. vii. 167 ; Sep. vii. 190; Oct. vii. 215 ; Nov. vii. 239 ; Dec. vii. 263.—1841, Jan. vii. 274 ; Feb. viii. 23 ; Mar. viii. 47 ; Ap. viii. 70 ; May, viii. 95; June, viii. 119 ; July, viii. 143 ; Aug. viii. 167 ; Sep. viii. 191 ; Oct. viii. 215 ; Nov. viii. 239 ; Dec. viii. 263.—1842, Jan. viii. 273 ; Feb. ix. 23 ; Mar. ix. 47 ; Ap. ix. 71; May, ix. 95 ; June, ix. 119 ; July, ix. 143; Aug. ix. 167 ; Sep. ix. 191; Oct. ix. 215; Nov. ix. 239 ; Dec. ix. 263.—1843, Jan. ix. 274; Feb. x. 23 ; Mar. x. 47 ; Ap. x. 71; May, x. 95 ; June, x. 119; July, x. 143; Aug. x. 167; Sep. x. 191; Oct. x. 216 ; Nov. x. 239 ; Dec. x. 263.—1844, Jan. x. 274 ; Feb. xi. 23 ; Mar. xi. 46 ; Ap. xi. 71; May, xi. 95 ; June, xi. 119; July, xi. 143; Aug. xi. 167; Sep. xi. 191; Oct. xi. 215 ; Nov. xi. 239 ; Dec. xi. 263.—1845, Jan. xi. 273 ; Feb. xii. 23 ; Mar. xii. 47 ; Ap. xii. 71; May, xii. 95 ; June, xii. 119 ; July, xii. 143 ; Aug. xii. 167 ; Sep. xii. 191 ; Oct. xii. 215 ; Nov. xii. 240 ; Dec. xii. 264.—1846, Jan. xii. 273 ; Feb. xiii. 23 ; Mar. xiii. 47 ; Ap. xiii. 71 ; May, xiii. 95 ; June, xiii. 119 ; July, xiii. 143 ; Aug. xiii. 167 ; Dec. xiii. 264.—1847, Jan. xiii. 273 ; Feb. xiv. 23 ; Mar. xiv. 48 ; Ap. xiv. 69 ; May, xiv. 94 ; June, xiv. 119 ; Sep. xiii. 215 ; Nov. xiii. 238; July, xiv. 143 ; Aug. xiv. 166 ; Sep. xiv. 191 ; Oct. xiv. 216 ; Nov. xiv. 239 ; Dec. xiv. 264.—1848, Jan. xiv. 274; Feb. xv. 24 ; Mar. xv. 48 ; Ap. xv. 72 ; May, xv. 96 ; June, xv. 120 ; July, xv. 144 ; Aug. xv. 168 ; Sep. xv. 192; Oct. xv. 216 ; Nov. xv. 240 ; Dec. xv. 264

Ophir, xv. 116

Ophrydeæ, ii. 270

Ophrys, ii. 159, 184; *æstrifera*, xiii. 213; *bicornis*, xiii. 213; cornuta, xiii. 213 ; arachnitis, xiv. 116 ; ferrum equinum, xiv. 189; fuciflora, xiv. 116 ; tabanifera, xiv. 189; apifera, xv. 33; aranifera, xv. 33

Opuntia Tuna, irritability of, i. 63; singular fact relative to the genus, v. 132 ; culture of, vii. 225; vulgaris in the open air, vii. 138; means of fruiting, v. 133

Orange, culture of, i. 89 ; trees, washing the roots of, v. 207; degree of light necessary, v. 158; to be started, iv. 72, 144, 192; trees to be taken out of the Orangery, iii. 120

Orange-coloured Bifrenaria, iii. 215

Orangeries, hints on the construction of, v. 158

Orchideæ, i. 14 ; culture of, i. 41, 151, 262 ; selection of first-rate epiphytal, ii. 125; second-rate, ii. 177; first-rate terrestrial, ii. 148; second-rate, ii. 174; culture by Mr. Beaton, ii. 263 ; species figured in the periodicals, ii. 79, 113, 164, 211, 262; house for, at Chatsworth, 150 ; directions about, ii. 125, 263; cultivation of, by Messrs. Rollisson, Tooting, iv. 45; shading, iv. 134; house, suspending plants from the roof of, v. 262; potting, v. 24, 47; general management of, v. 82, 85, 95, 119, 144, 168, 192, 239, 274; potting, vii. 47; habits indicative, the treatment they require, vii. 8, 26, 50, 122; shade, vii. 96 ; transference of blooming specimens to a cool shaded place, vii. 119, 168; heat and moisture essential to, in summer, vii. 120; period for diminishing the supply of heat, water, and shade, vii. 168; obtaining the Indian species not yet introduced, vii. 169 ; partially exposing a few of them in autumn, vii. 192; close relation of some of the genera, vii. 207; small specimens or peculiar species require constant stimulation, vii. 168, 240; winter management, vii. 264 ; receptacles for, viii. 47, 120, 264, ix. 48, 72, 96, 144, 214; rustic baskets for, ix. 89; composed of turf, ix. 90; of cocoa-nut husks, ix. 90 ; and of shells, ix. 91; on suspending in stoves, ix. 134 ; branches of trees for supporting, ix. 135 ; fastening to walls, ix. 135; leaf-mould for some kinds, x. 135 ; bottom-heat, x. 160, xiv. 13 ; season of repose, xiv. 230

Orchis, ii. 159, 184; tephrosanthos, densifolius, ii. 211; foliosa, viii. 236; fusca, xv. 33; hircina, xv.

33; latifolia, xv. 33 ; maculata, xv. 33

Oreodaphne bullata, ix. 93

Oriental Hawthorn, iii. 141

Origin of weeping trees, iii. 113

Orithyia uniflora, iii. 143

Ornamental Basket for greenhouse plants, iii. 132 ; creepers, ii. 33, 85, 107; Cast-Iron Garden-chair, iii. 257; plants, iv. 96 ; culture of, viii. 155, 179, 226, 253, xii. 64, 110

Ornithidium album, xii. 44

Ornithocephalus ciliatus, xi. 70

Ornithogalum chloroleucum, iii. 144; latifolium, iv. 189 ; divaricatum, ix. 117; marginatum, xii. 9; nanum, xii. 164; aureum, xii. 175

Orobus atropurpureus, ii. 112

Orothamnus Zeyheri, xv. 118

Orphium frutescens, xiii. 221 ; shrubby, xiii. 221

Orthosiphon incurvus, viii. 21

Orthrosanthes multiflora, xi. 245; its culture, xi. 246

Osbeckia canescens, vii. 91; stellata, *var.*, xi. 236

Othonna frutescens, ix. 214 ; tuberosa, x. 213

Otochilus fusca, ix. 21

Ovarium, partitions of the, vii. 233; either apocarpous or syncarpous, vii. 233 ; explanation of the terms superior and inferior, vii. 163, 234

Ovules, varieties of position assumed by, vii. 257

Oxalis, uses of, i. 229 ; culture, i. 229 ; crenata, ii. 72, 88, 120, 240; floribunda, iii. 72; rubella, iii. 72 ; alba, iv. 210 ; Barlerii fruticosa, iv. 133 ; bipartita, divergens, iv. 210 ; versicolor, iv. 44 ; acetosella, its presence an indication of the presence of iron, iv. 9 ; Barrelieri, vii. 94; geniculata, vii. 215 ; fruticosa, viii. 188 ; lasiandra, viii. 213; lasiopetala, ix. 94 ; rubrocincta, ix. 262; sensitiva, xiii. 45

Ox-eye-like Oxyura, iii. 118

Oxide of Iron, xv. 250

Oxyanthus versicolor, viii. 117 ; longiflorus, xii. 238

Oxygen, nature and properties of, ix. 202 ; character of, viii. 56 ; quantity in the air, viii. 105

Oxylobium pultenææ, ix. 149; culture of, ix. 150 ; capitatum, x. 69; obovatum, x. 166, 243

Oxypetalum solanoides, xv. 118

Oxyramphis macrostyla, xiii. 115; xv. 258

Oxyura chrysanthemoides, iii. 118

P.

Pachypodium tuberosum, v. 68

Pachystigma, xiv. 227

Pæonia edulis Reevesiana, i. 197; Moutan punicea, ii. 208; parviflora globosa, atropurpurea, lilacina, Salmonea, xv. 165 ; albiflora, *var.* Pottsii, iii. 262; notice of the genus, iii. 135, 237 ; Brownii, vi. 137 ; papaveracea rubra, vi. 116 ; tenuifolia plena, vi. 116, ix. 118 ; Witmanniana, xiii. 45; moutan, xiv. 33; papaveracea, xiv. 33; Witmanniana, xv. 233

Palms, tissue and ordinary structure of, vii. 38; xii. 90

Pancratium pedalis, i. 13 ; calathinum, iv. 53; humile, xiv. 92

Pandanus, singular habits of, vii. 38

Pandora tulip, ii. 211

Panicle of flowers, vii. 162

Pansies, Lady Peel and Nabob, ii. 261; Lavinia, John Bull, iii. 93, 166

Pansies, as flower-garden plants, xi. 157

Papaver orientalis bracteatum, iii. 12 ; crocea nudicaule, iii. 12 ; floribunda, iii. 12 ; somniferum, iii. 11; Rhæas, iii. 11; culture of the genus, iii. 11

Papaw, citron-fruited, v. 43

Pascalia glauca, viii. 125; xv. 233

Passiflora kermesina, i. 25 ; quadrangularis, i. 26 ; alata, i. 26; maliformis, i. 26; vespertilio, i. 26; fœtida, i. 26; rubra, i. 26; culture of the genus, i. 25, ii. 36, 86, iii. 31 ; kermesina, iv. 45, 71 ; Loudoniana, iv. 45 ; large-stipuled, v. 43; Lieutenant Sullivan's, v. 90 ; nigella-flowered, v. 43 ; kermesina and Loudoniana, culture of, v. 261 ; Loudoniana, v. 117 ; nigelliflora, v. 43 ; onychina, v. 90 ; Tucumanensis, v. 43; onychina, vi. 238 ; mooreana, vii. 19 ; verrucifera, vii. 212 ; quadrangularis, and probably other similar species, may be grown in a greenhouse, viii. 229 ; Middletoniana, ix. 51; culture of, ix. 52 ; Actinia, x. 93 ; different methods of treating, xii. 41; *aurantia*, xii. 44; Lemichezii, xiii. 238 ; serratistipula, xiv. 152 ; tiliæfolia, xiv. 152 ; alata, xiv. 151 ; alato-cærulea, xiv. 153 ; Buonapartea, xiv. 152 ; cærulea, xiv. 153; cæruleo-racemosa, xiv. 153; coccinea, xiv. 152 ; edulis, xiv. 152; fragrans, xiv. 153; incarnata, xiv. 152; laurifolia, xiv. 152; maliformis, xiv. 152; kermesina, xiv. 153 ; kermesina Lemicheziana, xiv. 151 ; Lemichez's crimson, xiv. 151; Loudonii, xiv. 153 ; Middletoniana, xiv. 153 ; Mooreana, xiv. 153; phœnicea, xiv. 152 ; picturata, xiv. 153 ; princeps, xiv. 153 ; quadrangularis, xiv. 152 ; racemosa, xiv. 153; sanguinea, xiv. 153; Neumannii, xv. 240; bearing eatable fruit, xiv. 152; selection of beautiful, xiv. 153

Passerina grandiflora, xii. 43 ; *ciliata*, xii. 43

Parasitical plants or leaves, ii. 40

Parastranthus, xv. 10

Park and Villa scenery, xiii. 105

Pateritia, Paxero, xi. 128

Patersonia sapphirina, vi. 257

Patrinia jatamansi, xv. 162

Paulownia imperialis, remarks on, ix. 141, x. 8; how to treat, x. 9; xiv. 212

Pavetta Caffra, iv. 136

Paxtonia rosea, raised from seed, viii. 100

Pear-leaved Thorn, iii. 213

Peat, description of, xii. 227

Peculiarities of plants, i. 29, 54; xiii. 225

Pelargoniums to preserve in winter, ii. 21; to propagate for autumn flowering, iii. 48, 144; iv. 48, 120, 168; full exposure to light necessary, v. 181; v. 96, 144, 168, 216 ; different divisions of, vii. 33; vii. 33, 60, 85, 108; viii. 48, 120, 144, 168, 192 ; ix. 144 ; ix. 216 ; Shepherd's Queen Victoria, x. 190 ; xiii. 250 ; on what success in the culture of is principally dependent, xiii. 205; the fancy as a plant for bedding out, xiii. 207 ; suitableness of various kinds of the, for growing in rustic stands or baskets, xiii. 207; xiv. 23, 131

Pencilled Evening Primrose, iii. 69

Pentas carnea, xi. 126; method of treating, xi. 126; xiv. 135

Pentlandia miniata; *vars.* lacunosa and Sulivanica, vii. 19

Pentstemon staticifolius, ii. 164 ; Murrayanus, iii. 94, 265; cobæa, iii. 70, 237 ; heterophyllum, iv. 16 ; various-leaved, iv. 16 ; latifolium, iv. 21; breviflorus, iv. 88; Scholeri, iv. 133; cobæa, iv. 165, 243 ; Murrayanus, iv. 167, 213 ; gentianoides, iv. 213, 265 ; cobæa, v. 163 ; crassifolius, v. 66 ; gentianoides, v. 138 ; Murrayanus, winter treatment of, v. 22 ; argutus, vi. 142, 272 ; barbatum, *var.* carneum, vi. 89 ; gentianoides, *var.*, vi. 214 ; speciosus, vi. 171; gentianoides, several varieties of, viii. 22; appropriate for placing in a protected border, viii. 15 ; crassifolius, ix. 197, 198, xv. 260 ; gentianoides splendens, ix. 175, 176, xv. 233; gentianoides, *var.* diaphanum, xii. 93, xv. 233 ; ovatum, xiii. 199, xv. 232 ; ovate-leaved, xiii. 199; Gordoni, xiv. 189, xv. 232 ; McEwani, xiv. 174, xv. 233

Pepper, on the cultivation of, iii. 253
Pepper-moth on roses, xiv. 167
Peperomia pallescens, xv. 118
Perennials, selection of, for stove, greenhouse, open borders, ii. 202, 208 ; collecting and sowing seed of, v. 192; benefited by yearly transplantation, ii. 207; propagation of tender, xi. 47
Pereskia aculeata, iv. 64 ; Bleo, iv. 70 ; an excellent stock for training Cactæ upon, ix. 187
Pergularia odoratissima, ii. 109, iii. 46 ; *campanulata*, xiii. 238, xiv. 27
Perianth, composition of the, vii. 231
Pericallia syringaria, xiv. 168
Pericarp, most prominent features of the, vii. 258
Periphragmos pyrifolia, xv. 166
Periploca Græca, ii. 37
Peristeria, ii. 160 ; pendula, iii. 119; cerina, iv. 117, 132 ; stapelioides, vi. 142; Humboldtii, x. 93; Humboldtii, *var.* fulva, xii. 117 ; Barkeri, xiii. 45, xiv. 146
Perneyttia angustifolia, vii. 261 ; mucronata, for winter gardens, xi. 253
Petalidium barlerioides, x. 261
Peterhoff, great fountain at, xi. 226
Petræa, ii. 107, 109 ; Stapelsiæ, iv. 199
Petunia violacea, i. 7 ; linearis, ii. 219 ; nyctaginiflora violacea, ii. 173 ; violacea, ii. 168, 192, 216; iii. 48, 144 ; propagation of, v. 168 ; treated as climbing plants, vi. 253 ; suggestions for training them to trellises on open lawns, viii. 96 ; new variety, xiv. 165 ; *spe. nov.*, xiv. 273
Phacelia congesta, iii. 94
Phædranassa chloracra, xii. 93
Phajus, ii. 160 ; albus, iv. 166, v. 125, 139 ; natural habitats of, v. 125 ; culture of, v. 159 ; distinction of the genus from Bletia, v. 126 ; bicolor, vi. 166 ; Wallichii, vi. 193 ; grandifolius, *var.*, vii. 46, ix. 23 ; bicolor, xi. 92 ; new species, xv. 71
Phalænopsis amabilis, xiv. 116 ; new variety, xiv. 263; v. 20, 69, 93, 162, 164 ; vii. 49
Phalocallis plumbea, vi. 42
Pharbitis diversifolia, iv. 209 ; ostrina, ix. 213, 243 ; Learii, in the open air, xiii. 84; cathartica, xiv. 92
Phaseolus, ii. 107, 110 ; caracalla, x. 267 ; lobatus, xi. 92
Phebalium, xiv. 225
Philadelphus, ii. 230 ; speciosus, iv. 259 ; Gordonianus, vi. 138 ; mexicanus, ix. 165, xv. 208
Philibertia gracilis, iv. 234 ; grandiflora, iv. 260, v. 141, vi. 7
Philotheca, xiv. 225
Phlogacanthus curviflorus, vii. 67
Phlomis cashmeriana, xi. 92, xii. 116
Phlox Drummondii, ii. 221, iv. 211; cordata grandiflora, iv. 191, xv. 1, 268 ; Youngii, v. 259 ; chief points in the cultivation of the genus, vii. 198 ; Coldryana, vii. 197, xv. 234 ; Van Houtte's, x. 22 ; Alcardi, xi. 173 ; bicolor, xi. 173 ; Princess Marienne, xi. 173 ; Van Houtte's, xi. 173, xv. 233 ; Drummondii alba, xii. 142; varieties, xii. 191 ; Leopoldiana, xiv. 267, xv. 261
Pholidota, ii. 184
Phycella, ii. 69 ; chloraca, xi. 95
Phyllarthron bojerianum, xii. 164
Physianthus albens, ii. 109 ; auricomus, viii. 188, xii. 46, 166, xiii. 93
Physiological botany, v. 113
Physolobium, distinction of the genus from Kennedya, viii. 142; carinatum, viii. 142 ; gracilis, viii. 142 ; carinatum, ix. 118 ; gracile, ix. 118
Physostegia truncata, iii. 165, iv. 237 ; imbricata, v. 174 ; virginica, xiv. 215
Phytolacca, xv. 186
Picea, soil suitable for the species of, vii. 65
Picotees, Miss Miller, and Emperor of China, iii. 110
Picturesque, remarks on the, ix. 139
Piddingtonia, xv. 12
Pigmy Oncidium, iv. 19 ; moth, red-headed, xiv. 71 ; satin, 72
Pilocarpeæ, xiv. 225
Pilocarpus, xiv. 225
Pilumna laxa, xiii. 237
Pimelea incana, v. 116 ; Hendersonii, vi. 88, xv. 264 ; incana, vi, 22, 71 ; nana, vii. 190 ; spectabilis, viii, 70, 140 ; disbudding, x. 63 ; hypericina, xi. 94 ; affinis, xii. 166 ; Stuartii, xv. 118 ; Weippugiana, xv. 191
Pinaioua, xv. 136
Pinaua, xv. 136
Pine Apple tribe, ii. 210
Pines, effect of, at a distance, ix. 158
Pinguicula orchidioides, xiii. 116
Pink, culture of, i. 74 ; criterion of a fine one, i. 75 ; ii. 144 ; Victoria, and Sir Walter Scott, ii. 262 ; Ann Boleyn, and Superb, iii. 71, 24 ; Middlesex Beauty, iii. 262; Warden and Omega, iii. 262; Carnations, Roses, &c., for early flowering, iii. 264 ; to be fumigated, &c. iv. 24, 120, 144 ; Mr. Henderson's, xiv. 126
Pinus, the rarer species of, increased by grafting, vi. 94 ; vinifolia, iii. 121 ; general treatment of the genus, vii. 62 ; situation in which the species succeed best, viii. 37
Pistacia Lentiscus, xiv. 34, xv. 89, 183
Pitcairnia undulatifolia, xiii. 164
Pit-coal, iv. 57
Pitcher Plant, culture of, iv. 1
Pith, nature, position, and contraction of, vi. 178 ; origin of, xi. 36
Pits and frames, management of, v. 264 ; most suitable for forcing plants into flower, v. 216 ; ventilation of, xi. 114
Plan of a cutting-house, i. 111 ; flower-garden, i. 154, 184 ; the plant stove at Chatsworth, ii. 105 ; a rosary for Scotch roses, iii. 139
Plantain, iii. 51
Plantations, directions for disposing shrubs in, vi. 82 ; those formed for shelter usually inimical to plants, vi. 204, ix. 157 ; the effect of, xii. 215
Plant-houses, comparison of ancient with modern, vi. 249 ; necessity for consulting the comfort of proprietors in, vi. 254, vii. 24, 71, 96, 120, 144, 168, 192, 216, 239, 264, x. 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264 ; on economising room in, x. 252 ; xi. 23, 47, 72, 96, 120, 143, 168, 216, 239, 263, 273 ; xii. 264, 240 ; light and air to admit to, the advantage of, xii. 240 ; xiv. 205
Planting trees for ornament, i. 46 ; evergreen shrubs, ii. 114, 222 ; deciduous, ii. 222 ; suggestions about, ix. 235 ; evils of deep, ix. 235 ; out half-hardy plants, x. 96 ; summer border plants, xi. 72 ; showing shrubs in masses, xi. 136 ; in groups of one species, xi. 137 ; reasons for preferring autumn, xi. 259 ; points necessary to attend to in, xii. 264
Plants, to preserve choice ones from slugs, i. 16 ; treatment of, in rooms, i. 39 ; causes of their dying, i. 39 ; remarks on those which possess the power of catching flies, i. 54 ; irrritability of, i. 31 ; nervous system of, i. 31 ; effects of poisons on, i. 31 ; definitions of, i. 32 ; reproduction of, i. 270 ; to keep in a torpid state in cellars during winter, ii. 20 ; to preserve on a sea voyage, ii. 90 ; choice selection of climbers for the open air, ii. 33 ; for the greenhouse, ii. 85 ; for the stove, ii. 107 ; a mode of labelling, ii. 148 ; peculiarities of, ii. 79 ; fly-catching

properties of certain, ii. 79; sleep of, ii. 80; effects of heat and moisture upon, ii. 113; natural decay of, ii. 47; dry stove, ii. 53; damp stove, ii. 54; propagation of stove species, ii. 55; suitable for grouping in the flower-garden, ii. 108; planted out with a view to endure the open air, iv. 120; in pots, and management of cuttings, iv. 225; influence of climate upon, v. 110, 131, 155, 179, 293; importance of studying the natural habits of, iv. 111; effects of sudden exposure on exotic, v. 203; elements of, viii. 55; their influence on animal life, viii. 106; nourished chiefly through the atmosphere, viii. 129; in frames, management of, ix. 23; for flower-beds, xi. 157, 182; attention to trifles in the culture of, xi. 256, 260; in drawing-rooms and plant-cases, xii. 108; suitable for rockwork in stoves, &c., xii. 131; in what the ashes of consist, xii. 204; injured from their pots being exposed to bright sun, xii. 136; to obviate, xii. 137; value of moist atmosphere for, xii. 81; separate structures for different, xii. 161; utility of, xii. 162; greenhouse, description of pit for, xii. 162; growing on the conservative wall at Chatsworth, list of, xii. 63; additional recommended, xii. 64; a consideration of growing in pots, xiii. 37; stimulants to the better cultivation of, xiii. 37; evils preventing the proper management of, xiii. 38; points necessary to attend to in managing well, xiii. 39; diseases and affections of, xiii. 201; greenhouse, on planting in the open ground in summer, xiii. 221; parasitic diseases of, xiii. 225; various, constitutionally liable to disease, xii. 226; peculiarities of, xiii. 225; putting tender in the open ground in spring ought to be practised, xiii. 191; fine, xiv. 165; habits of, xiv. 229, 232; hard-wooded, xiv. 232; list of tender ones which have borne the open air, xiv. 36; profuse flowering of, xiv. 113; winter-blooming, xiv. 131; repose of, xiv. 233, 251; exposure of, xiv. 177; hardy herbaceous, xv. 232
Platanus-leaved Begonia, iii. 125
Platycodon grandiflorus, vi. 166, xiii. 7; parviflorum, xi. 219; formosum, xiii. 195
Platystemon californicum, iv. 136, 189, v. 141, vii. 118; leiocarpum, vi. 211
Platystigma lineare, iv. 115
Pleasure grounds, greenhouse climbing plants as summer ornaments to, vi. 172; description of at Dropmore, xiii. 108
Pleasures of gardening, v. 153
Plectranthera ciliosa, xi. 3
Pleroma elegans, xiii. 190, 237; Benthamiana, x. 93, xi. 238; petiolata, xi. 267; *Benthamiana*, xii. 125; Mr. Kunth's, xii. 125; Kunthiana, xii. 125; elegans, xiv. 215, xv. 27
Pleurothallis saurocephala, iv. 164; recurva, xi. 142; bicarinata, xii. 45
Plumbago zeylanica, xiii. 93; Larpentæ, xiv. 271, xv. 260; new species, xiv. 21, 239
Plumiera rubra, ii. 114; acuminata, ix. 165
Plumule, constituents of the, vii. 259
Plum, Hog, xv. 40; Zanzee, xv. 41; Oghigee, xv. 41; Bourbon, xv. 41; Java, xv. 42
Podolobium, ii. 85, 87; staurophyllum, iv. 171; berberifolium, ix. 118
Podotheca gnaphalioides, ix. 21
Pogogyne multiflora, xv. 118
Pogonia, ii. 160, 184
Poinciana Gilliesii, ii.; pulcherrima, iii. 3; Gilliesii, x. 94; pulcherrima, xiv. 134
Poinsettia pulcherrima, iii. 163, 165, iv. 97, xiv. 134
Poiretia linearis, xii. 75
Poison bulb, i. 164; effects of poisons on plants, i. 31
Poles recommended for supporting roses and other hardy climbing plants, vi. 13; ix. 114
Polianthes tuberosa, i. 166
Pollen, consistence of, vii. 233
Polmaise heating, xiv. 79, 82
Polyanthus, general culture of, i. 108; selection of choice ones, i. 111; ii. 120; Fletcher's Defiance, iii. 143; tuberosa, *var.* flora pleno, iii. 168, 264; seed to be sown, iv. 48; potted, iv. 96, 120
Polygala myrtifolia, *var.* grandiflora, iv. 260; chamæbuxus, a winter garden plant, xi. 253
Polygonum acutatum, xiii. 115; *cymosum*, xiii. 115; amplexicaule, vi. 186
Polypetalæ, chief characteristics of, vii. 231
Polystachya bracteosa, xii. 117; reflexa, viii. 142
Pomaceæ, ii. 208
Pomegranates, culture of, i. 64; causes of barrenness, i. 64; history and introduction of, i. 64; pruning, i. 65; grafting, i. 65; ii. 24, 120, 168, xiv. 34
Ponceletia, culture of the genus, i. 53
Ponthiera, ii. 184
Porana volubilis, ii. 109
Porcupine Cactus, glaucous sweet-scented, v. 138
Pores, nature and offices of vegetable, vi. 85
Porosity of wood, ii. 22
Porous plants require little light, v. 113
Porphyrocome lanceolata, xii. 94, 189, xiv. 53
Port Famine Fuchsia, iii. 165
Portugal Laurels, standard, viii. 58
Portulaca Gilliesii, iii. 192; Thellusonii, vii. 140; cultivating the species of, vii. 256; Thellusonii, viii. 29; in the open ground, the greenhouse, and the stove, viii. 30; splendens, x. 166, 263
Posoqueria versicolor, viii. 117
Potash, properties of, xi. 228; the grand agent in vegetable nutrition, viii. 154
Potentilla, culture of the genus, i. 170; atro-sanguinea, hybrid Russelliana, iii. 70; Thomasii, iv. 41, 211; Hopwoodiana, iv. 211; formosa, iv. 191; Garneriana, iv. 165; ferruginea, v. 223; glabra, v. 209; Tonguii, v. 187; Hopwoodiana, vi. 149, xv. 233; insignis, viii. 164; new varieties of, x. 262; bicolor, xii. 261; Macnabiana, xiii. 190, 219, xv. 233; Menziesii, xv. 240, 247
Pots, improved kind of, v. 177; those employed by nurserymen usually too small, v. 184; for early crocuses and bulbs, viii. 17; shallow ones most desirable, ix. 253; for plants, improved forms of, x. 42, 89; Brown's patent, x. 42; Hunt's patent, x. 90
Potting plants, soils used by nurserymen in, v. 183; important principles to be attended to in, v. 208, vii. 34, 47; proper season for, vi. 71; the habits of plants to regulate the manner of, viii. 49; time for a general, viii. 47, 71; suggestions for, ix. 24, 47, 235; remarks on a novel method of, x. 12, 36, 84, 108; hints about, x. 48; the advantages of early attention to, xi. 46
Pott's Chinese Pæony, iii. 262
Poupartia, xi. 41; Borbonica, dulcis, mangifera, xv. 42
Pourretia cærulea, vii. 42
Power of soils, to absorb water from, iv. 11
Pratia, xv. 12
Precocious developments, necessity for checking, viii. 191, 239
Premature development in plants, modes of remedying, x. 23
Prepusa Hookeriana, viii. 261
Preservation of flower-garden plants in winter, xiii. 181; ob-

stacles which prevent the proper, xiii. 181; the little fluid necessary for, xiii. 183 ; the best erection for, 184
Primroses, double crimson, double white, iii. 93
Primula vulgaris, i. 108 ; sinensis, i. 181, ii. 120 ; to be potted, iii. 96 ; sibirica integerrima, iii. 18; auricula, *var.* Achilles, iii. 18, 192 ; sinensis, iv. 21; venusta, iv. 188 ; sinensis, *var.* plena, vi. 262, viii. 273, ix. 23 ; denticulata, ix. 191; involucrata, xiii. 141 ; Chinese, xiv. 135 ; insects infesting, xiv. 168 ; sinensis, xiv. 135
Procrastination, evils of, in gardening, ix. 23
Productiveness of soils, iv. 11
Pronaya, elegant, xii. 99, xv. 258
Propagation, period at which it is usually performed, vii. 72 ; by grafting, vii. 201; rationale of the process, vii. 202 ; its application and usefulness, vii. 203 ; most appropriate system, vii. 204, viii. 48 ; of exotics, ix. 96 ; of border plants, xi. 168 ; hot water to produce bottom-heat for, xii. 11; iii. 22, v. 48, 168, 255, vi. 72, 144, 192 ; likely manner in which the common methods originated, vii. 201 ; of hardy shrubs, vii. 23 ; tender plants for the borders, ix. 24, 72, 168 ; ix. 96, x. 96, xiii. 160
Prostanthera lasianthos, xii. 143
Proteaceæ, ii 209
Protea, culture of the genus, i. 231; ii. 88, 120, 144
Protection of plants in winter, ii. 216 ; tent, strictures on a, v. 249; in the winter season, v. 249, 263 ; rules to be observed in the, vi. 108 ; of plants, principles by which it should be regulated, vii. 132, 133 ; mode of applying it to borders containing exotics, viii. 15 ; for tender shrubs, viii. 63, 240; injurious to half-hardy shrubs when continued too long or too constantly, viii. 64 ; ix. 24, 274, xi. 24, 216, 239
Pruning growing exotics, essay on, ix. 35; evergreens and deciduous shrubs, ii. 216
Pruning and training plants to form standards, xi. 14 ; to be commenced at the earliest period of growth, xi. 16 ; removing rudimentary laterals, xi. 17 ; cutting back the main shoots, xi. 17 ; application to various species, xi. 19 ; the advantages of, on plants of straggling habitude, xi. 40 ; remarks on summer, xi. 95 ; objections against late spring, xi. 47 ; reasons for performing it on hardy plants in November, xi. 250 ; origin and primary application of, vii. 11 ; chiefly necessary for hybrids, vii. 11 ; few genuine species require it, vii. 11 ; time for effecting it on hardy shrubs, vii. 23; errors in its practice, vii. 23, viii. 264 ; growing exotics, essay on, ix. 35 ; *rationale* of the plan, ix. 38 ; general remarks on, ix. 264 ; evergreens, advantage of doing it partially in the summer, x. 167 ; substitution of disbudding for, x. 65; and training, xiii. 135 ; extensiveness of field for the practice of, xiii. 136 ; the best season to practise, xiii. 138 ; objects of, xiii. 138, xiv. 136
Prussic acid, effects of, on plants, i. 31
Pseudo-bulb, definition of the term, v. 245
Psidium Cattleyanum, i. 119 ; low temperature not injurious to, v. 252
Psoralea orbicularis, iv. 163
Pterocarpus santolinus, xv. 110
Pterodiscus speciosus, xi. 215, 236
Pterophorus rhododactylus, xiv. 72
Prerostigma grandiflorum, xiii. 70
Pterostylis concinna, ii. 79 ; acuminata, ii. 79
Pultenea juncea, xiv. 123
Pulteney, Dr., opinions on the Ranunculus aquatilis by, i. 42
Pump, Lucas's self-acting, i. 156
Punica, xiv. 34
Puya cærulea, vii. 42; heterophylla, viii. 21; Altensteinii gigantea, xiv. 189
Pyrus, ii. 231; japonica, iii. 23, xiv. 33

Q.

Quekettia microscopica, vi. 23
Quisqualis, ii. 107, 109 ; sinensis, xi. 92

R.

Rabbit Berry, culture of, iv. 106
Raceme of flowers, the arrangement peculiar to a, vii. 162
Radiation, its nature, causes, laws, and effects, vi. 108; most copious in the spring months, vi. 23; best means of checking, vi. 24 ; capacity for, in different substances, vi. 36 ; vii. 82 ; manner in which it is effected, vii. 131 ; its interruption the proper way of protecting plants, vi. 132 ; xiv. 130, xv. 154
Radicle, importance of noticing its direction, vii. 258
Rafflesia Arnoldi, i. 153
Rain water contains ammonia, viii. 178 ; hence its superior fitness for watering plants, viii. 179
Raking ground ought not to be done in hot weather, x. 71 ; hints on, xi. 258
Rambootan, xv. 84
Ramusatia vivipara, xiii. 92
Ranunculaceæ, ii. 208, iii. 16
Ranunculus aquatilis, uses of, i. 42; asiaticus to raise from seed, i. 45; mode of culture, i. 43; taking up, i. 44; stand for preserving, i. 44; criterion of a good one, i. 46 ; parnassifolius, i. 42 ; to be planted, iv. 48 ; the Turban, an early blooming plant for flower-beds, xi. 182
Raphistemma pulchella, xiii. 138, xiv. 27
Rattan cane, xv. 235
Rauch, M. F., on Euphorbia fulgens, iv. 32
Rays of the sun, different descriptions of, vi. 11
Reading, excellent method of, vi. 208
Receptacles, for Orchidaceæ, viii. 113 ; for early flowering bulbs, viii. 17
Red headed pigmy moth, ii. 213 ; Cosmelia, iii. 44 ; flowered fragrant Daphne, iii. 45 ; side Saddle-flower, iii. 261 ; spider, xiv. 96 ; sandal-wood, xv. 110
Reddish-blue Ipomæa, iii. 99
Redoutea heterophylla, xiii. 69
Reevesia thyrsoidea, xiii. 45
Refraction of heat, way in which it occurs, vii. 131
Rehmannia chinensis, iv. 135, v. 116
Rejections of plants, v. 206
Relation of vegetation to seasons, iii. 201
Remarks on heating hothouses, ii. 53 ; on the formation of a rosary for Scotch Roses, iii. 138 ; on the genus Nerium, iii, 232 ; on the genus Hoya, iv. 13 ; on the Camellia, xiii. 109 ; on the Pelargonium, xiii. 205
Renanthera coccinea, i. 15, ii. 127, 140, v. 164, iv. 49, xiv. 273 ; matutina, x. 23, 188, xiv. 116
Repose requisite for orchidaceæ, nature of the, vi. 50, 157 ; proper period of, vi. 107 ; of plants necessary, vi. 105
Reproduction of plants, i. 270
Reproductive power of plants increased in proportion to the elevation of temperature, vi. 84
Repton's works on Landscape Gardening reviewed, x. 45
Reseda, culture of the genus, ii. 5
Resins, their presence in plants an indication of a great degree of light being required, v. 112 ; analysis of, xi. 155
Rest necessary for exotic plants, v. 215, 239
Retrospect of the seasons, xiii. 249

Review of the Hand Book of Plain Botany, ii. 94 ; Lindley's Ladies' Botany, ii. 115 ; Florigraphia Britannica, iii. 39 ; Florists' Magazine, iii. 160 ; Companion to Botanical Register, iii. 34 ; Loudon's Encyclopædia of trees and shrubs, ix. 140; Sir Uvedale Price on the picturesque, ix. 138 ; Repton's Landscape Gardening, ix. 141; Loudon's edition of Repton's Landscape Gardening, x. 45 ; the Suburban Horticulturist, x. 46 ; Mrs. Loudon's "Lady's Country Companion, or How to enjoy a Country Life Rationally," xii. 138; George H. Johnson's, Esq., "The Principles of Practical Gardening," xii. 139 ; James Lothian's "Practical Hints on the Culture and General Management of Alpine or Rock Plants," xii. 236 ; "The Vegetable Kingdom," by J. Lindley, Ph. D., F.R.S., and L. S., &c. xiii. 185 ; Mr. Paul's Rose-garden, xiv. 138

Rhexia virginica, should be grown in heathmould, x. 263

Rhipsalis brachiata, x. 213

Rhizoma, a modification of the stem, vii. 112 ; its peculiarities, vii. 113

Rhodanthe Manglesii, iii. 116, 173, iv. 94; culture of, v. 201

Rhodochiton volubile, ii. 27, 36, 48, 86, 264, iii. 72 ; and Lophospermum erubescens, for a south wall, iii. 96

Rhododendron arboreum, i. 101 ; pulchrum, i. 126 ; indicum Smithii, i. 126 ; arborea fimbriata, ii. 98; indicum speciosum, ii. 78; venustum, ii. 112; indicum Smithii, ii. 145; nudiflora eximia, ii. 163; calendulaceum, fulgidum, cinnamomeum, ii. 231 ; azaleoides, ii. 231 ; caucasicum, ii. 231 ; campanulatum, ii. 231; and several other kinds, ii. 231; campanulatum, iii. 118 ; arboreum, hints on, iii. 64; to flower early, iii. 24 ; chamæcistus, iii. 169; arboreum, *var.* roseum, iii. 164 ; *var.* undulatum, iii. 212; flavum, *var.* coronarium, iii. 117; Cunninghamii, iv. 71 ; arborea, iv. 71, 130 ; cinnamomeum, iv. 95 ; multimaculatum, iv. 133 ; Phœniceum, *var.* splendens, iv. 137; arborea, *var.* cinnamomeum, iv. 188 ; albiflorum, v. 185 ; Cunninghamii, v. 69 ; guttatum, v. 118; hybrid, v. 67; watering, v. 96 ; collecting seed of, v. 254 ; shaded situation necessary for, v. 180; house most suitable for the tender species of, v. 180; propagated by grafting, vi. 93; cinnamomeum floribus roseis, vii. 236; guttatum, vii. 118; prefer a sheltered and somewhat shaded spot, viii. 39; plan of preparing standard, viii. 58; Gibsonii, viii. 217; system of cultivating, viii. 218 ; anthopogon, ix. 143 ; Smithii aureum, ix. 79; culture of, ix. 80; instructions for layering, ix. 264; situation and soil proper for, ix. 208; suggestions for growing them in leaf-mould, x. 137; fragrans, x. 147; treatment of, x. 148: Rollissonii, x. 118; aprilis, xi. 43; as standards, xi. 19 ; for growing in masses, xi. 137; arboreum Paxtoni, xiv. 99; catawbiensis, xiv. 34; fastuosum flore pleno, xiv. 118; javanicum, xiv. 191, xv. 217, 256; Jenny Lind, xiv. 118; maximum, xiv. 34; metropolitanum, xiv. 118; Mr. Paxton's Tree, xiv. 99; new species, xiv. 118 ; new variety, xiv. 142 ; ponticum, xiv. 34; pruning of, xiv. 136; arboreum Paxtoni, xv. 257 ; Smithii aureum, xv. 209; Standishii, xv. 210; barbatum, aprilis, chamæcistus, fragrans, javanica, nilagiricum, xv. 211

Rhodora Canadense, iv. 70

Rhodostemma gardenioides, xiii. 118

Rhus diversiloba, xii. 164

Rhynchoglossum zeylanicum, xiii. 45

Rhynchopetalum, xv. 12

Rhytidophyllum floribundum, xv. 142

Ribenta cavallos, xv. 8

Ribes sanguineum, i. 3 ; aureum, i. 4 ; sanguinea, ii. 24, 48, 232 ; speciosa, ii. 233 ; fragrans, ii. 233 ; malvaceum, iii. 164 ; directions for propagating the various species of, v. 72, 264 ; the species of, most readily propagated by slips, vii. 23 ; hybrid, ix. 118 ; albidum, x. 55, 95 ; sanguineum flore-pleno, xii. 121; albida, sanguinea flore pleno, xv. 210

Rice, on the cultivation of, iii. 253

Richardia æthiopica, culture of, v. 225

Ridge and furrow roofs for plant-houses, arguments in support of, viii. 256

Rigidella flammea, vii. 67, 247 ; singular properties and culture of, vii. 248 ; immaculata, ix. 21; orthantha, xiv. 121

Robinia pseudo-acacia, iv. 143

Rochea albiflora, xiii. 210; coccinea, xiii. 208; the synonymes of, xiii. 208; falcata and synonymes, xiii. 208; jasminea, xiii. 209 ; synonymes of, xiii. 209 ; media and synonymes, xiii. 208 ; odoratissima, xiii. 209 ; the synonymes of, xiii. 209; odoratissima alba, xiii. 209; versicolor, xiii. 208 ; its synonymes, xiii. 208

Rockeries suitable for mesembryanthemums, v. 130; remarks on the formation of, v. 227 ; hints on forming and placing, viii. 135; objectionable positions for, viii. 138; the formation of, xii. 87; their suitableness for many plants to grow upon, xii. 88; xiv. 50

Rocks and rock-plants, xii. 86, 129; on introducing into the conservatory and stove, xii. 129; most suitable material for forming, xii. 130

Rockets, culture of, i. 108; iv. 144, 192

Rodriguezia, ii. 140; Barkeri, iii. 166; planifolia, iii. 214; crispa, vi. 238, viii. 212

Roella elegans, v. 165, 260; ciliata, vii. 245; way to bring it to perfection, vii. 246 ; elegans, management of, vi. 27

Rolandia, xv. 12

Ronalds, Mr., propagating house by, i. 111

Rondeletia speciosa, i. 158; culture of the genus, i. 158, ii. 88; figure, ii. 242; odorata, iv. 21; longiflora, ix. 217; management of, ix. 218; *longiflora*, xi. 142, 197; speciosa major, xii. 47

Roof for a plant structure, the form of, most adapted to particular kinds, viii. 257

Roofs of plant structures, materials most suitable for the, v. 34; of plant-houses, a covering of garden mats over them in winter economises heat, vi. 23

Rosmarinus, xv. 254

Roots, pathology of, ii. 37; of tender plants, importance of protecting the, v. 263 ; advantages of reducing those of some plants, vi. 156 ; probable origin of, vii. 39; their distinction from stems, vii. 112; necessity for disposing them properly in transplantation, vii. 95 ; definition and structure of, xi. 9; functions of; i. 129, 250; cramping them a means of ensuring dwarfness, xi. 40

Rose Apple, xv. 60

Roses, culture of, i. 138 ; selection for training against a wall, i. 144; forcing, i. 144 ; retarding the blooming of, i. 144 ; diseases, i. 145 ; chemical analysis of the sap, i. 146 ; ii. 209 ; evergreen kinds, ii. 35 ; celestial, ii. 209 ; Tourterelle, ii. 209 ; blight, ii. 41 ; mining insect on rose trees, ii. 213 ; centifolia, iii. 94 ; muscosa, iii. 94 ; cristata, iii. 94 ; microphylla, iii. 141 ; trees in-

troduced to the forcing house, iii. 24 ; Village Maid, iii. 17 ; Rouge de Luxembourg, iii. 237, 238 ; lutea, *var.* plena, iv. 16 ; sinica, iv. 41 ; indica, *var.* Blairi, iv. 260 ; to be fumigated, iv. 24 ; to be taken up, iv. 144 ; forced, iv. 70 ; budded, iv. 144 ; suggestions on pruning, v. 240 ; propagation of China, v. 72, 120 ; suggestions for budding, vi. 192 ; training the climbing species to poles, vi. 13 ; soil and situation best suited to the climbing sorts, vi. 15 ; hints on pruning, vii. 11 ; directions for budding, vii. 168 ; advantages of grafting some of the scarcer kinds, vii. 205 ; devoniensis, viii. 169 ; Devonshire, viii. 169 ; remarks on forcing, viii. 208 ; best time for pruning tender, viii. 48 ; season for layering, viii. 216, 264 ; suggestions for budding so as to form standards of various heights, viii. 168 ; their uses in landscape gardening, ix. 141 ; pruning requisite for the particular kinds of, ix. 264 ; Brunonii, x. 188 ; Hardii, x. 195, way to grow, x. 196 ; M. Hardy's, x. 195 ; how to train standard, xi. 15, 19 ; the forcing of, xiii. 33 ; preparation and treatment of plants for forcing, xiii. 33 ; the most suitable soil for, xiii. 33 ; chaffers, xiv. 71 ; garden reviewed, xiv. 138 ; insects infesting the, xiv. 167 ; Leaf-roller Moth, xiv. 72 ; perpetual, xiv. 162 ; Plume Moth, xiv. 72 ; Alpine or Boursault, xiv. 168 ; anemoneflora, xiv. 142
Rosslinia frutescens, xiii. 221
Roxburghia, ii. 108 ; viridis, v. 117
Royenia lucida, xiii. 164
Roylea elegans, x. 71
Rubus, many species of, interesting when trained to poles, vi. 16
Rudbeckia Drummondii, v. 181, vi. 51
Rudiments of plants, inquiry into their organisation, vi. 58, 153 ; of the Natural System of Botany, vii. 36, 111, 161, 231
Ruddy Godetia, iii. 143
Ruellia anisophylla, ii. 112 ; ciliatriflora, vi. 90 ; isophylla, xi. 46 ; lilacina, xii. 94, 243 ; its cultivation, xii. 244 ; *Coromandeliana*, xiii. 187 ; *intrusa*, xiii. 187 ; lilacina, xiii. 70, 188 ; *longiflora*, xiii. 70 ; macrophylla, xiii. 46 ; *obliqua*, xiii. 187 ; *secunda*, xiii. 187 ; coromandeliana, xiv. 125 ; grandiflora, xiv. 30 ; intrusa, xiv. 125 ; large-leaved, xiv. 29 ; longiflora, xiv. 30 ; macrophylla, xiv. 29, 135 ; obliqua, xiv. 125 ; Purdieana, xiv. 116, 273 ; secunda, xiv. 125 ; trivialis, xiv. 30
Rumphius, observations by, on the pitcher of Nepenthes, i. 57
Ruscus androgynus, ii. 86
Rushbroom, leafless, xiv. 123
Russelia juncea, iii. 168, iv. 79 ; remarks on, vii. 229 ; heath-soil requisite for, vii. 230 ; ix. 136
Ruta, xiv. 228
Rutaceæ, xiv. 222

S.

Sabine, Joseph, Esq., division of spring crocuses by, i. 202
Saccalobium guttatum, ii. 141 ; præmorsum, iv. 94, 119 ; guttatum, iv. 119, v. 140 ; bifidum, vi. 262 ; calceolare, vi. 97 ; culture of, vi. 98 ; papillosum, vi. 214, 239 ; denticulatum, vii. 145 ; new species, viii. 22 ; guttatum, xi. 211 ; ampullaceum, xiii. 49 ; guttatum, xiv. 142 ; miniatum, xiv. 116
Saccharine matters generated by heat, vi. 159
Saccharum officinarum, ii. 269
Sacred bean, yellow-flowered, vi. 233
Sad-coloured Cirrhæa, iii. 262
Saffron-coloured Eschscholtzia, iii. 49
Sagittaria sagittæfolia plena, x. 263
Salac, xv. 89
Salisbury, R. A. Esq., on the introduction of the tuberose, i. 166
Salpichroa glandulosa, xii. 166
Salpiglossis linearis, ii. 219
Salpixantha coccinea, xii. 117
Salts, their presence in soils detectible, vii. 105 ; the best manures, viii. 154
Salvias, iii. 96, 144
Salvia canescens, v. 161 ; patens, v. 212, 236 ; confertiflora, vi. 114, 166 ; linarioides, vi. 191 ; patens, vi. 1 ; treatment of, vi. 2 ; linarioides, vii. 77, 78 ; tubifera, viii. 188 ; confertiflora, *var.* viii. 236 ; hians, viii. 164 ; regla, viii. 69 ; prunelloides, xi. 175 ; strictiflora, xi. 247 ; *elata*, xii. 31 ; *acuminata*, xii. 31 ; *longifolia*, xii. 31 ; *mexicana*, xii. 31 ; *angustifolia*, xii. 31 ; acuminatissima, xii. 31 ; azurea, xii. 31, xv. 232 ; bicolor, xv. 232 ; linarioides, prunelloides, xv. 232 ; leucantha, xiv. 189 ; new species, xiv. 94, 273 ; patens, xiv. 23 ; oppositiflora, xv. 23, 53
Salvadora persica, xv. 187
Sambucus, xiv. 252
Sandal tree, xv. 111
Sanders tree, xv. 110
Sand, utility of blending it with the compost for exotic plants, vii. 254 ; origin and properties of, xi. 65, 223
Sandoricum, xv. 111
Santalum album, xv. 111
Santoor, xv. 111
Sap of plants, remarks about the, x. 81 ; of the Vine, interesting fact concerning, xi. 130 ; components of, xi. 251 ; vessels, Mr. T. A. Knight's opinion respecting, vi. 9
Sapota Plum, xv. 107
Saracha viscosa, iii. 70
Sarauja spectabilis, x. 22 ; macrophylla, xiii. 190
Sarcanthus, ii. 140 ; teretifolius, iv. 117
Sarcochilus falcatus, iii. 71 ; calceolus, xiii. 93
Sarcostemma campanulatum, xiii. 165
Sarracenia, remarks on, by Mr. Murphy, i. 54 ; Sir J. E. Smith, i. 55 ; leaf of S. flava, figured, i. 55 ; culture of the genus, i. 56 ; rubra, iii. 261 ; purpurea, iii. 221 ; new species, iv. 21
Satin Pigmy Moth, xiv. 72
Satureja montana, xv. 254
Satyrium, ii. 160, 184 ; pustulatum, vii. 67 ; aureum, xv. 31
Saucers for flower-pots, Hunt's patent, x. 90
Saul, Mr., on heating by hot-water, ii. 58 ; an apparatus figured, ii. 59
Sauseviera fruticosa, xiv. 65
Saussurea pulchella, ix. 94
Saw-flies infesting Rose-trees, xiv. 71
Saxifraga ciliata, xi. 44 ; thysanodes, xiii. 141
Scævola attenuata, xii. 262
Scale insects, xiv. 95 ; black turtle, xiv. 95 ; brown, xiv. 95 ; brown limpet, xiv. 95 ; small brown, xiv. 95 ; small white, xiv. 95
Scenery, park and villa, xiii. 105
Sceptrum-flowered Gesneria, iv. 116
Schafta, xv. 261
Schizanthus retusus, i. 5 ; pinnatus humilis, i. 6 ; Priestii, i. 31 ; humilis, ii. 198 ; retusus, ii. 168, iii. 48, 72, 216 ; Evansianus, viii. 171, 172 ; candidus, x. 214
Schizopetalon Walkeri, iv. 136
Schomburgkia marginata, vi. 139 ; undulata, xii. 239 ; tibicinis, *var.* grandiflora, xii. 141 ; crispa, xi. 92 ; undulata, xi. 71
School of Horticulture, a great central, viii. 10
Schubertia graveolens, xiii. 93, xiv. 87 ; *auricoma*, xiii. 93
Schweiggeria pauciflora, viii. 164
Science of Botany, as a necessary study for the young gardener, iii. 234 ; of gardening, x. 9, 33, 57, 81, 105, 129, 153, 177, 201, 245, 249, v. 154, vii. 129, viii. 9, 33, 55, 81, 105, 129, 153, 177, 201, 223, 249, xv. 9, 33, 57, 79, 104, 105, 129, 153, 177, 201, 225, 249

Scilla cupaniana, iii. 215 ; pratensis, vi. 258 ; Peruviana, *var.* discolor, x. 214 ; bifolia, xiv. 100 ; sibirica, xiv. 100

Sclerotheca, xv. 10

Scotch Roses, list of double kinds, iii. 140 ; should not be much pruned, vii. 13 ; plan of growing Mimulus moschatus among them, vii. 14

Scottia dentata, iii. 192 ; lævis, iv. 44

Scraper for the garden, i. 75

Scutellaria macrantha, i. 235 ; splendens, ix. 273 ; japonica, x. 123, xv. 260 ; splendens, ix. 99, xiii. 190 ; incarnata, xiii. 263, xiv. 142 ; ventenatii, xiv. 20

Scyphanthus elegans, x. 3, 190 ; culture of, x. 4

Seacoal, iv. 57 ; lavender, xiv. 254

Seasons, retrospect of the, xiii. 250; plants' repose, xiv. 229 ; characteristics of, xiv. 175

Seats for the garden, ii. 71

Sedum cæruleum, iv. 132 ; Sieboldii, v. 187

Seeds, to preserve, on a Sea voyage, ii. 161 ; directions for collecting and preserving, v. 167 ; light necessary to nature, v. 183 ; more easily transportable than plants, vi. 61 ; heat essential to elaborate and mature, vi. 192 ; their production beneficial to strong plants, vi. 34 ; but injurious to weakly ones, vi. 157 ; those most prolific which are obtained from very fertile plants, vi. 134 ; plants raised from seeds are always more or less hardy or tender according to the climate in which these are ripened, vi. 158 ; exposure necessary to ripen, vii. 119 ; their hardihood affected by maturation in heat, vii. 136 ; observations on their germination, vii. 144 ; differences in the time of their vegetation accounted for, vii. 144 ; suggestions for collecting and storing, vi. 190 ; the earliest means by which plants were increased, vii. 201 ; their organisation, vii. 258 ; those usually thought naked not really so, vii. 258 ; viii. 48, 168 ; analysation of, x. 9 ; on removing the rind of some, x. 19 ; their production weakens plants, x. 108 ; the flowering season perpetuated by their abstraction, x. 109 ; annuals changed into shrubs, if prevented from forming them, x. 109 ; sowing, x. 192 ; necessity of a series of sowings, xi. 47 ; conditions essential, xi. 260

Seed-leaves, their office, ix. 59

Seed-pods, necessity of removing them from Rhododendrons, &c., x. 167

Seed-saving, directions for, x. 144, 191

Seed-sowing, time for a general, x. 48 ; hints on, x. 144

Seed-vessels, to remove, xi. 120

Seedling plants, less hardy if raised in artificial heat, vii. 136 ; in a small state best for acclimatising, viii. 62

Selago distans, xii. 189

Selection of annuals, i. 22 ; of biennials, i. 67 ; of camellias, i. 38 ; plants for bedding out, xv. 232 ; hardy herbaceous plants, xv. 232 ; green-house shrubs, xv. 232

Sellow's Gesneria, iv. 27

Senecio cruentus, vi. 42 ; Heritieri, *var.* cyanopthalmus, vii. 236 ; calamifolius, x. 94

Sensibility of plants, i. 31

Serapias, ii. 185

Sericographis Ghiesbreghtiana, xv. 47, 176

Shade, proper method of applying, xi. 143

Shallow soil necessary in acclimatation, viii. 37, 62 ; advantages of, x. 208

Shells an ornamental feature in rock-work, v. 229

Shelter, directions for the efficient employment of, v. 108 ; that of a permanent description inappropriate, v. 184 ; different modes of applying, v. 263 ; necessary for alpine plants, v. 230

Shelves in plant-houses, economy in the use of, x. 254

Shepherdia argentea, culture of, iv. 106

Shifting plants, remarks on, v. 109

Short-spurred Tropæolum, iv. 41

Showy Nemophila, iii. 151, 117 ; Poinsettia, iii. 165 ; Kalosanthos, iii. 237 ; Zenobia, iii. 117 ; shrubs, on planting them in masses, iii. 136

Shrubberies, i. 46, v. 7, vi. 82 ; most appropriate time for digging, vii. 24, 47 ; bone dust as a manure for them, vii. 47

Shrubs, a select list of, with hints on the peculiar culture of each, iii. 177 ; forcing of, iv. 24 ; season for pruning, v. 240 ; time for planting, v. 264 ; planting solitarily, vi. 83 ; necessity for frequently pruning exotic, x. 38 ; their peculiar fitness for grouping, x. 181, 204 ; places in which they should be employed, x. 205 ; the shape of the groups considered, x. 207 ; the formation and drainage of beds for them, x. 208 ; kinds best adapted for the purpose, x. 228 ; a selection of beautiful hardy, x. 224, 216, xv. 208 ; time for transplanting, viii. 216, 263

Sida inæqualis, ii. 261 ; *asiatica*, xii. 21 ; *hirta*, xii. 21 ; *graveolens*, xii. 21 ; indica, xii. 21 ; vitifolia, xiii. 116 ; integerrima, xv. 119

Siebe's patent syringe, i. 23

Siebold's Clematis, iv. 147

Silene laciniata, i. 267 ; chloræfolia, iv. 209 ; speciosa, x. 219, xv. 261 ; schafta, xiii. 93, xv. 261

Siliceous or flinty soils, vii. 10

Silphium terebinthaceum, iv. 17

Silver Arched Moth, xiv. 72

Silver tree, xiv. 63

Simsia anethifolia, xiv. 211

Sinapis Kabi, xv. 185 ; orientalis, turgida, fruticosa, xv. 185

Sinningia guttata, ii. 4 ; villosa, iv. 190 ; Youngeana, vii. 51 ; velutina, xiii. 46

Sipanea carnea, x. 263

Siphocampylos bicolor, iv. 163, 195 ; v. 163 ; betulæfolius, x. 71 ; longipedunculatus, x. 118 ; betulæfolius, x. 223 ; lantanifolius, *var.* glabriusculus, xi. 188 ; coccineus, xii. 167, 173 ; *macranthus*, xiii. 149 ; *spectabilis*, xiii. 149 ; *surinamensis*, xiii. 149 ; microstoma, xiv. 92 ; manettiæflorus, xv. 267 ; *spe. nov.*, xv. 72 ; macrostoma, xv. 72 ; nitida, xv. 166 ; Caoutchouc, xv. 8, 11

Siphon-flower, scarlet, xii. 173

Sir James Stirling's Kennedia, iii. 117

Sisyrinchium grandiflorum, iv. 71, 137 ; graminifolium, *var.* pumilum, iv. 20

Slate, for horticultural purposes, xii. 36

Slugs, i. 16, xiv. 70

Smeathmannia lævigata, vii. 262 ; pubescens, xv. 119

Smith, Sir J. E., on Dionœa muscipula, i. 61 ; on Sarracenia, i. 55

Smith, Mr., plan of a flower-garden by, i. 184

Smoke, means for consuming, v. 81

Smooth-leaved Kennedia, iii. 93

Snail plant, x. 267

Snails destructive to Clianthus puniceus, v. 108

Snapdragon, larger four-coloured, x. 197 ; double purple flowering, xi. 99 ; blooms longer if not allowed to seed, x. 110 ; Mr. Young's, xiii. 271

Snow, protection afforded to plants by, v. 230

Sobralia sessilis, viii. 69 ; macrantha, x. 263 ; macrantha splendens, xiv. 190, 241

Soils, ii. 187, iii. 240, iv. 12, 228 ; admission of air, &c., tends to improve, iv. 12 ; improved by

adding to, iv. 13 ; effects of burning, iv. 13 ; prepare, iv. 24; importance of turning them frequently, v. 239 ; burning, v. 209 ; exposure to the air useful for destroying extraneous matters in, v. 208 ; used by nurserymen in potting plants, v. 183 ; value of a chemical analysis of, vi. 208 ; very slightly influential in promoting fertility, except as ready vehicles of nutritive fluids, vi. 132 ; excellent mode of analysing, vii. 9, 58, 105, 250 ; advantages of turning and exposing, vii. 95, viii. 33, x. 57 ; economy in, xi. 184 ; primitive formation of, xi. 228 ; investigation of, xii. 225 ; conducting power of, xiii. 154
Solandra, ii. 108
Solaneæ, ii. 107, 110
Solanum, ii. 107, 110 ; crispum, iii. 1 ; Herbertia, iv. 119 ; campanulatum, v. 186 ; fragrans, v. 234 ; Herbertianum, v. 269 ; jasminoides, vi. 273 ; uncinellum, vii. 67 ; jasminoides, viii. 5 ; treatment of, viii. 6; macrantherum, viii. 44 ; Balbisii, *var.* bipinnata, x. 166 ; macranthum, xii. 45 ; jasminoides, xiv. 140 ; pseudo-capsicum, xiv. 263 ; lycioides, xv. 258
Solar light, vi. 10, xiv. 128, xv. 57; heat, vi. 33, 59, 84, 107, 132, 155, 181, 204 ; rays, viii. 223
Sollya, ii. 85, 87 ; heterophylla, iii. 144, vii. 20; salicifolia, vii. 20 ; linearis, vii. 20
Sophora juncea, xiv. 128
Sophronitis cernua, iv. 236 ; grandiflora, vi. 42, viii. 273, x. 193, 194
Sour-sop, xv. 134
Sowerbæa laxiflora, viii. 44
Spadix, definition of the word, vii. 162
Span-roofed houses, viii. 232
Sparaxis lineata, grandiflora, tricolor, i. 8 ; Wattii, xi. 214
Sparmannia Africana, culture of, iv. 204
Spartium acutifolium, iv. 163 ; junceum, *var.* odoratissimum, iv. 163 ; *spinosum*, xiii. 236
Spathodea pentandra, v. 234
Spathoglottis Fortuni, xii. 94
Spatula-leaved Thorn, iii. 260
Speckled Nephomila, iv. 67
Speedwell, showy, x. 247 ; Dr. Lindley's, xii. 247
Sphærostoma propinquum, iii. 109
Sphenogyne speciosa, v. 189, vi. 77
Spider Orchis, xv. 33
Spikenard, xv. 161
Spilonota aquana, xiv. 72 ; cynostabella, xiv. 72
Spine cactus, tube-flowered, v. 17
Spiræa japonica, iv. 166 ; barbata, v. 15 ; kamtchatica, *var.* himalensis, viii. 21 ; japonica, vii. 211 ; vaccinifolia, vii. 68, xv. 208 ; Reevesiana, xi. 44 ; Lindleyana, xii. 141; Mr. Douglas's, xii. 195 ; Douglassii, xii. 195 ; prunifolia flore pleno, xiv. 69 ; pubescens, xiv. 116, 189 ; expansa, xv. 119
Spiral vessels in plants not conductors of fluids, vi. 9 ; xi. 107
Spiranthes, ii. 185
Spiranthera Fraseri, xii. 99 ; xiv. 225
Spironema fragrans, vii. 70
Spittal, Robert, Esq., on diseases of plants, ii. 37
Spondias amara, lutea, myrobalanus, oghigee, purpurea, zanzee, xv. 41
Spongioles, character and office of, vii. 112
Sprekelia formosissima, i. 149 ; cybister, *var.* brevis, vii. 141 ; cybister, viii. 117 ; glauca, viii. 69
Spring the most trying season for exotic plants, vi. 239
Squill, Siberian, xiv. 100 ; two-leaved, xiv. 100
Stachys coccinea, viii. 101, xv. 261
Stachytarpheta aristata, xiii. 46
Stages in plant-houses, x. 253
Staking and supporting plants, vi. 120, vii. 120, x. 68, 96
Stalagmites cowa, celebica, cochinchinensis, xv. 206
Stamens, not abortive leaves, vii. 232
Standard Portugal Laurels, viii. 60; specimens of Ivy, x. 17 ; Honeysuckles, x. 209 ; Fuchsias, proper cuttings to choose for forming, xiii. 14
Stanhopea, ii. 141 ; insignis, iii. 95, iv. 165 ; oculata, eburnea, iv. 165; quadricornis, v. 18; Wardii, v. 211; tigrina, vi. 20 ; wire baskets for, viii. 114 ; aurea, viii. 23 ; Martiana, *var.* bicolor, x. 191, 214 ; tigrina, vii. 190, 191 ; Bucephalus, xii. 117 ; inodora, xiii. 46 ; tigrina, xiii. 46, xiv. 142
Stapelia, culture of the genus, iv. 92, v. 132, vii. 229 ; cactiformis, xii. 21
Staphylodendrum africanum, xiii. 164
Star Apples, xv. 180
Starch, analysis of, xi. 154 ; deposited in the cells of plants, xi. 105
Statice arborea, iv. 217; conspicua, iv. 218 ; sinuata, iv. 218, xv. 17; spathulata, iv. 218 ; speciosa, iv. 218 ; arborea, v. 93, 118, 189 ; monopetala, *var.* denudata, x. 239 ; pseudo-armeria, x. 118 ; macrophylla, x. 263 ; Dickensoniana, xi. 44; pseudo-armeria, xi. 79 ; rhytidophylla, xi. 44 ; —— ? xii. 167 ; Fortuni, xii. 261, xv. 19, 260 ; eximia, xv. 20; puberula, imbricata, mucosa, rhytidophylla, purpurata, xv. 17 ; macrophylla, xii. 21 ; *cephalotes*, xii. 18 ; *armeria major*, xii. 18, xiv. 254, xv. 16 ; imbricata, xv. 19
Statistics of trees, attention invited to, vii. 135
Stauntonia latifolia, xiii. 212, xiv. 69
St. Cloud, fountain at, xi. 226
Steam, combustible energy of, v. 253 ; its great power when confined, vii. 83
Steel's Maxillaria, iv. 117
Stelis atropurpurea, x. 239
Stems, wounded by insects, ii. 45 ; general structure of, xi. 11 ; analysis of, xi. 12 ; exogenous, xi. 33 ; endogenous, xi. 57
Stenanthera pinifolia, xiv. 89
Stenia pallida, v. 91
Stenocarpus Cunninghamii, xiv. 1, 21
Stenomesson latifolium, vii. 141 ; vitellinum, x. 22; Hartwegii, xi. 188
Stenorhynchus, ii. 160 ; cinnabarinus, xv. 21
Stephanotus floribundus, vi. 142, x. 186, xi. 29 ; Thouarsii, xii. 167 ; floribunda, xiv. 27, 85 ; Red-spider on, xiv. 86 ; Thouarsii, xiv. 86
Sternbergia, ii. 69 ; colchiflora, v. 16
Stevia fascicularis, v. 257 ; breviaristata, vii. 91; trachelioides, viii. 69
Stiff-stalk, upright-flowered, xiv. 121
Stigma, separation or entity of the, vii. 233
Stigmaphyllon aristatum, ii. 109 ; heterophyllum, x. 118; ciliatum, xv. 77 ; jatrophæfolium, xi. 44
Stimulation, its value to tropical plants in the summer, vi. 48
Stipules, their distinction from true leaves, vii. 113 ; nature of, x. 35
Stock, double, caused by disease, i. 240 ; culture of, 29 ; directions about, ii. 48, 168 ; iv. 240 ; importance of preventing them from seeding when required only for bloom, x. 110
Stothert's, Mr., mode of heating by steam, ii. 65
Stove, plan of, at Chatsworth, ii. 105 ; plants, propagation of, ii. 13 ; general culture, ii. 53, 240 ; selection of climbers, ii. 105, 107 ; shrubs, a selection of the most beautiful, iii. 79; propagation of, iv. 120 ; to be potted, iv. 72 ; notice on, iv. 240 ; remarks on

Dr. Arnott's, v. 253 ; plants, agency of light upon, practically considered, v. 113 ; importance of having two houses for the cultivation of, v. 114 ; general management of the, v. 24, 47, 72, 95, 119, 144, 168, 192, 216, 239, 263, vii. 24, 47, 71, 72, 96, 120, 144, 168, 192, 216, 239, 264, 274 ; directions for potting, viii. 47 ; advantages of bottom-heat for, x. 160 ; repose of, xiv. 232 ; aquariums, viii. 111 ; necessity for cleaning them thoroughly in the autumn, x. 168, 192
Stranvæsia glaucescens, iv. 116
Strawberry tree, i. 168
Street, Mr., on acclimatising, xiv. 35
Strelitzia augusta, xii. 164
Streptanthera cuprea, i. 8; elegans, i. 8
Streptocarpus Rexii, iv. 81 ; light injurious to the flowers of, v. 204; directions for forcing, xi. 240
Strobilanthes, xiv. 30 ; Sabiniana, iii. 261; scabra, viii. 141; sessilis, viii. 236
Strobilus, description of a, vii. 162
Structure of plants, each organ perfect, xi. 178
Strumaria, ii. 69
Stylidium fasciculatum, vi. 142 ; Brunonianum, x. 94 ; pilosum, x. 166; recurvum, x. 21 ; scandens, xiii, 166, xv. 149 ; ciliatum, viii. 164, xiv. 162
Styphelia, tube-flowered, xii. 29 ; tubiflora, xii. 29, xi. 46; longifolia, i. 53
Stuartia pentagyne, xv. 208
Subscription gardens, design for forming, i. 211
Succulent plants, treatment of, i. 41, iii. 96 ; to be propagated, iv. 72 ; influence of light upon, v. 132, vii. 177, 205, 225, 251 ; hints on shifting, viii. 48, x 24 ; interesting character of, xiii. 210 ; ii. 53, 240, 264
Sugar cane, ii. 269
Sugar, analysis of, xi. 154; of Grapes, obtained from their starch, xi. 106
Suitableness of some kinds of Dahlias for forming dwarf masses, xiii. 88
Summer ornaments of the flower-garden, period for rearing the, vi. 72 ; pruning, the advantages of, xi. 96
Sunbeams, xiv. 128
Suncress, trifid, xiv. 219
Sundew, peculiarities of, i. 62 ; narrow-leaved, iv. 20
Sun dial, design for a, v. 40
Sunflower, a popular fallacy respecting, i. 217
Sun's rays the source of all colour in vegetation, v. 182 ; the source of vitalising agencies, xiv. 128 ; the fountain of light, xiv. 129
Support of plants, how obtained, xi. 229
Surrey Zoological Gardens, i. 184
Suspension of plants in greenhouses and stoves, x.
Swainsonia Greyana, xiv. 21 ; coronillæfolia, xv. 258, 223
Sweet Calamus, xv. 235
Sweet Hay, xv. 236
Sweet-sop, xv. 134
Sweet William, culture of the, i. 67; ii. 168, iii. 216
Symmetry of parts, necessary to constitute beauty in plants, vi. 66 ; desirable in plant structures, viii. 231
Symphoria, ii. 233
Symphytum officinale bohemicum, ii. 261
Sympieza, ii. 92
Syringa, ii. 233 ; Josikeii, v. 140 ; erroneousness of the system of shortening their shoots, vii. 23 ; Emodi, xii. 22
Syringe, hints on its use, vii. 60, 120, 144
Syringing plants, great utility of in the summer, vi. 144, viii. 144, x. 120, xiii. 119
Systematic arrangement of living plants deprecated, vi. 82
System, vii. 232; difference between those termed perigynous, epigynous, and hypogynous, vii. 232

T.

Tabernæmontana dichotoma, viii. 236
Table mountain, Africa, climate of, xi. 91
Tachia longifolia, xii. 164, xiii. 29
Tacsonia pinnatistipula, i. 249, ii. 72, vii. 137, 173; mollissima, xii. 239, xiii. 25, 46 ; singular part of the structure of, xiii. 25; very soft, xiii. 25
Talauma Candollii, xiii. 213
Talinum teretifolium, x. 22
Talisman Calceolaria, or Slipper Wort, iii. 27
Tall Habenaria, iii. 167
Tallest Oncidium, iii. 144
Tallies for plants made of rolled zinc, i. 155, 183 ; of lead, i. 124
Tamarindus, remarks on, and culture of the genus, iii. 110
Tank for bottom-heat, xii. 106, xiii. 11
Tannin, nature and properties of, xi. 155
Tansy-leaved Hawthorn, iii. 236
Taper-leaved Vanda, iii. 19
Tasmannia aromatica, xii. 189
Tecoma jasminoides, iv. 259, vi. 199 ; best mode of flowering, vi. 200 ; grandiflora, viii. 89 ; management of the species, ix. 252
Telfairia pedata, iv. 230
Telipogon obovatus, xiv. 116
Telopea speciosissima, iii. 273, v. 73; causes of failure in the cultivation of, v. 73
Temperature of hot-houses, iii. 264 ; equability of, v. 80 ; most congenial to exotic plants in the winter months, v. 192, 215, 252, 263 ; of plant-houses in summer, vi. 47 ; of plants, vi. 108 ; of plant-houses, directions for regulating the, vii. 24, 72, 96, 120, 144, 168, 192, 240 ; x. 32 ; of plant-houses should be lower at night, x. 34 ; high night, injurious to plants, xii. 106 ; and Meteorology, xiv. 127
Templetonia glauca and retusa, xii. 111
Tenacity of soils, arising from, iv. 10
Tender annuals to be sown, iv. 48 ; plants in the flower-garden, v. 96 ; season for protecting, v. 240 ; sheltering, v. 263 ; exotics in the open air, viii. 11, 85 ; annuals, time for sowing, ix. 24 ; perennials for the flower-garden, ix. 95, 168, 216 ; climbers for summer purposes, ix. 112 ; a list of them, ix. 114 ; their uses, ix. 113 ; plants, preserving during winter, ix. 215, 219 ; plants, propagation of, xi. 47 ; protection of, xi. 24, 216, 239 ; to be gradually inured to the weather, xi. 71 ; turning into the borders, xi. 72 ; and general management, xi. 119, 167, 191, 215
Ten-week Stocks, ii. 30
Terebinthine Silphium, iv. 17
Terminalia angustifolia, xiv. 65
Terms, importance of precision in the use of botanical, vii. 111, 161 ; abstruse ones explained, vii. 112, 161
Ternstromiaceæ, ii. 262
Testa, its nature stated, vii. 259
Testudinaria elephantipes, iv. 21, 190
Tetranema mexicanum, x. 239 ; mexicana, xii. 190
Tetratheca, hairy, xiii. 53 ; hirsuta, xiii. 53, xv. 258 ; *speciosa*, xiii. 171 ; verticillata, xiii. 118, 171, xv. 258 ; verticillate, xiii. 171
Tetrazygia elæagnoides, xv. 166
Texas Lupin, iii. 142
The planting season, xii. 254 ; when to plant, xii. 255; preparation of ground, xii. 256; choosing plants, xii. 257 ; removal and replanting, xii. 258
Thea Bohea, xiv. 33 ; viridis, xiv. 33
Theophrasta americana, xiii. 165 ; *Henrici*, xiii. 165 ; Jussieui, xiii. 165
The Conservatory, xiii. 57 ; purposes of, xiii. 57; fuchsia as a standard, xiii. 13 ; Neapolitan violet, xiii. 90

Thermometer, does not indicate the cold caused by winds, vii. 81, 84 ; the human feelings a better guide in tempestuous weather, vii. 84 ; in July, 1847, xiv. 178
Thibaudia, hints on the genus, &c., iv. 253 ; sinchinensis glabra, xv. 21; pulcherrima, xiv. 140, xv. 258
Thick-flowered Leptosiphon, iii. 220
Thinning annuals, rules for, x. 120
Thomasia stipulacea, xi. 212
Thomas's Cinquefoil, iv. 41
Three-leaved China Rose, iv. 41 ; Chironia, iii. 149
Thread-leaved Coreopsis, iii. 212
Thrift, false, xi. 79 ; culture of, xi. 80
Thrips adonidum, xiv. 70 ; minutissima, xiv. 168
Thuja filiformis, ix. 94
Thunbergia alata, ii. 107, 108; *var.* alba, iii. 28 ; culture of the genus, iii. 7 ; fragrans, iii. 8 ; grandiflora, iii. 65; alata suitable for planting on lawns, vi. 251; aurantiaca, vi. 215 ; culture of, vi. 216 ; Hawtayneana, vi. 147, 148 ; grandiflora, vii. 221 ; mode of training, vii. 222 ; in the open ground during summer, viii. 253 ; plan for suspending and allowing their branches to droop, ix. 136 ; chrysops, xi. 143, 221; habit influenced by temperature, xi. 221 ; way to succeed in growing, xi. 222 ; chrysops, xiii. 118; Fryeri, xiii. 118 ; Doddsii, xv. 266
Thryallis, ii. 107, 110
Thyrsacanthus strictus, xv. 166
Thyrse-flowered Dichorizandra, iii. 127
Thysanotus proliferus, v. 43, vi. 142, vii. 29, 30 ; intricatus, vi. 167, 244
Ticorea, xiv. 225
Tiger-flower, Watkinson's shell, xiv. 51
Tigridia pavonia, culture of the, i. 85, iv. 48 ; conchiflora, xiv. 51 ; Watkinsoni, xiv. 51
Tillandsia rubida, ix. 262 ; stricta, xv. 47, 125
Tinea ruficapitella, ii. 213
Tithonia ovata, viii. 237
Tobacco, xiv. 201 ; paper, to prepare, xiv. 204
Tooth-leaved Ardisia, iii. 260 ; Tongue, magnificent, viii. 49 ; Cervantes, xii. 193 ; Tongue, cordate-lipped, xiii. 147
Top-dressing, utility of, v. 208 ; evils of, ix. 16
Torenia cordifolia, vi. 68 ; scabra, ix. 53 ; cultivation of, ix. 54 ; arachanensis, xv. 197, xiii. 166, 190 ; asiatica, xiii. 143, 189, xv. 197 ; edentula, xiii. 116, xv. 197 ; *hians*, xiii. 189 ; *vagans*, xiii. 189; concolor, xiv. 21, xv. 197
Torpidity in plants, vii, 215 ; methods of protracting, xi. 23 ; the importance of, xi. 263
Touch-me-not, stemless, v. 101
Tourrettia lappacea, vi. 212
Tourterelle rose, ii. 209
Trachymene albida, vii. 22
Tradescantia Virginica, flore albo, iii. 214 ; caricifolia, iv. 43 ; iridescens, vii. 141 ; tumida, vii. 165
Trailing plants and their culture, x. 233
Training plants to form standards, xi. 14 ; climbers, natural mode of, xi. 207, xiii. 196 ; xiv. 136
Transpirations of plants, their effects upon other species, v. 204
Transplanting, importance of shading plants after, v. 183 ; annual and hardy plants, vi. 96 ; why it is useful, vi. 133 ; points to be regarded in, vii. 95 ; of exotics, ix. 95
Trechocorys adonidum, xiv. 95
Tredgold, Mr., on heating by hot-water, ii. 100
Trees, planting for ornament, i. 46 ; deciduous, i. 46 ; evergreen, i. 46 ; apparatus for removing, i. 47 ; supporting, i. 47 ; disposition of, iii. 106, vi. 81 ; manner in which they modify the temperature of any district, vi. 205; best time for ascertaining the propriety of felling, vii. 190 ; on planting singly, viii. 159 ; where detached specimens are objectionable, viii. 160 ; and where appropriate, viii. 161 ; localities in which groups should prevail, viii. 160 ; period for shifting, viii. 216, 263
Tree-pink, Prince Bisignani's, v. 138
Trellises, arched, for covering small walks in the pleasure-grounds, vi. 160 ; form most suitable for supporting dwarf climbing plants, vi. 161 ; best adapted for supporting climbing plants, viii. 65 ; for tender climbers, ix. 113
Tremandra Hugelii, x. 53 ; *verticillata*, xiii. 171
Trevirana coccinea, i. 169, ii. 264, iii. 14, 24, 192
Treviranus, M., observations on the Nepenthes by, i. 58
Trichinium alopecuroideum, vi. 114
Trichocentrum fuscum, iv. 90, 236
Trichonema rosea, i. 8
Trichonemata Græca, xiv. 189 ; pylium, xiv. 189 ; subpalustre, xiv. 189
Trichopilia tortilis, iii. 167
Trichosanthes colubrina, xiii. 94
Trichosma suavis, ix. 94
Trichosporum albidum, xiii. 139 ; *radicans*, xiii. 262
Trichostomum aciculare, xv. 253
Trifles, importance of attention to, in plant-culture, xi. 256
Trigonedium obtusum, iv. 42
Trimeris, xv. 11
Trimmer, Mr. J. R. on flashes of light issuing from flowers, ii. 193
Triosteum, xiv. 250
Tripetelus, xiv. 253
Triphæna pronuba, xiv. 168
Triptilion spinosum, viii. 93, 269 ; how to manage, x. 270, xv. 260
Tritelaria uniflora, iv. 43
Tritonia fucata, v. 162; aurea, xiv. 215, xv. 3, 21
Trochetia grandiflora, xi. 92
Trollius acaulis, x. 166
Tromsdorffia speciosa, xiii. 237
Tropæolum majus atrosanguineum, i. 176 ; tricolorum, ii. 123 ; majus venustum, ii. 193 ; culture of several species, ii. 86 ; pentaphyllum, &c., iii. 114, 192, 153 ; brachyceras, iv. 41, 55 ; tricolorum, iv. 237 ; tuberosum, iv. 236 ; Jarrattii, v. 29 ; peregrinum, v. 211 ; tricolorum, methods of improving, v. 165 ; tuberosum, v. 49 ; culture of, v. 50 ; novel method of preserving the species of, from drought, v. 166 ; tuberosum, peregrinum, and pentaphyllum, partial hardihood and treatment of, vi. 251 ; tricolorum and brachyceras, remarks on exposing and propagating, vi. 250 ; tuberosum, period for taking up the tubers of, vii. 216 ; Moritzianum, viii. 21, 199, 273 ; its culture, viii. 200 ; azureum, ix. 247, 248, 273 ; edule, ix. 127, 128 ; tricolorum, ix. 18 ; polyphyllum, ix. 118, 175, x. 176 ; Lobbianum, xi. 165, 271, 272 ; peltophorum, xi. 271 ; tricolorum, explanation of the increasing bulk of stem in, xi. 231 ; crenatiflorum, xiii. 189 ; spes, xiii. 143 ; azureum, xiv. 118 ; Lobbianum, xiv. 134 ; showy, xiv. 142, 173, 214 ; speciosum, xiv. 142, 173, 214, xv. 191 ; umbellatum, xv. 21, 191 ; Smithii, xv. 166
Tropical climbing plants, natural habits of, v. 113
Trumpet-flower, tendrilled, viii. 245 ; painted, x. 125 ; Mr. Chamberlayne's, xiv. 3
Tuberose, history and introduction of, i. 166 ; culture of, i. 168 ; to be encouraged, iv. 120 ; to be planted, iv. 72
Tuberous-rooted plants, change of soil for, v. 208 ; removing from the ground in autumn, vii. 216

Tubers of tropæolum tuberosum edible, v. 50
Tuettæa, xv. 8, 11
Tufted-flowered Phacelia, iii. 94
Tulbaghia violacea, iv. 66
Tulip-fly, xiv. 168
Tulip, history of, i. 160 ; Pandora, ii. 211 ; Duchess of Kent, iii. 264
Tulips, iii. 19, 24, 45, 119, 215 ; to be examined, iv. 48 ; protection of, v. 72, 264
Tupa blanda, ii.
Turf-edgings for gravel walks should not be too low, x. 71 ; its uses in potting plants, x. 60
Turnera elegans, xi. 52 ; ulmifolia, xii. 22
Turner, Dr., observations on the water in the pitchers of Nepenthes by, i. 58
Turræa lobata, xi. 45
Tussilago Farfara, its presence an indication of blue clay, iv. 9
Tway blade, xv. 33
Tweedia cærulea, iv. 260, v. 238 ; floribunda, v. 212, vi. 125, 126
Tweedie's Scarlet Vervain, iv. 5, 19
Twisted-petalled Trichopilia, iii. 167
Two-coloured Collinsia, iii. 195

V.

Vaccineæ, ii. 209
Vaccineum albiflorum, ii. 209 ; braziliense, xii. 101 ; cæspitosa, ii. 209 ; corymbosum, ii. 260 ; pennsylvanicum, ii. 261 ; Vitis Idœa, xi. 253
Valentiana, xiv. 250
Valentine, Mr., on the Nepenthes, i. 58
Valeriana celtica, xv. 162 ; dioscorides, xv. 162 ; jatamansi, xv. 162 ; officinalis, xv. 162 ; phu, xv. 162 ; saliunca, xv. 162 ; sitchensis, xv. 162
Vallota, ii. 69
Valleys, their effects on plants, vi. 183, viii. 37
Vanda Batemannii, xiv. 21, xv. 167 ; cristata, ix. 118, 191, xiv. 118, 141 ; insignis, xv. 47 ; lamellata, vi. 143 ; multiflora, ii. 142 ; Roxburghii, ii. 142, iv. 190 ; species new, xv. 72 ; teres, iii. 19, v. 117, 193, 194, xiv. 142, xv. 191 ; tesselata, iv. 190, vii. 265, 266 ; tricolor, xv. 22 ; unicolor, vii. 22 ; violacea, ix. 119, xiv. 141.
Vandeæ, ii. 113, 211, 142
Van Houtte's Phlox, xi. 174
Vanilla, ii. 141 ; aromatica, ii. 127
Vascular system of plants, xi. 105
Vegetable acids, xi. 157 ; absorption, xv. 13 ; decomposition, v. 11 ; developments, ix. 33 ; dilutium for destroying insects, xi. 240 ; fluids, vi. 154 ; food, viii. 129, 154 ; electricity, xiii. 130, 153 ; elements, viii. 55 ; life, vi. 85, viii. 106 ; metamorphosis, vii. 231 ; nutrition, xv. 202 ; physiology, vi. 9, 57, 153, x. 249, xi. 9, 33, 57, 81, 105, 129, 153, 177, 201, 227, 249 ; oils, xi. 156 ; poisons, i. 32, 54 ; organisation, vi. 85
Vegetation, its capacity for accommodating itself to circumstances, vii. 178 ; importance to it of a period of rest, vii. 226 ; effects of winds upon it, vii. 18
Ventilation of plant-houses, v. 38, 216, vi. 96, 143, 167, 240, 263, vii. 120, 144, viii. 258 ; its importance in winter, viii. 24, 47, 72, 144, 168, 240, xi. 114
Venus's fly-trap, iii. 252
Verbena amœna, vii. 3, 4, 96 ; araniana, v. 117 ; chamædrifolia, iv. 167 ; chamædrifolia superba, v. 213 ; Drummondi, iv. 168 ; incisa, v. 17 ; Lambertia rosea, iv. 19, 216 ; management of, iii. 32, 72, v. 168, 244, vi. 253, xiv. 191 ; melindres, i. 173, ii. 88, 168, 192, 216 ; multiflora contracta, ii. 164 ; Neillii, v. 213 ; pulchella alba, iv. 167 ; rugosa, iii. 45, 237 ; teucrioides, v. 243 ; trained as standards, xi. 19 ; Tweediana, iv. 5, 19, 168, 192 ; Tweediana splendens, v. 188
Veronica Lindleyana, xii. 247, 248, xv. 211 ; perfoliata, iv. 65 ; speciosa, x. 247, 248, xii. 66 ; salicifolia, xiii. 47
Versailles, fountains at, x. 226
Verticordia insignis, iii. 258
Vesicaria gracilis, iv. 18
Viburnum, culture of, xiv. 250 ; macrocephalum, xiv. 189, xv. 209 ; new species, xiv. 118 ; plicatum, xiv. 914, xv. 209
Victoria cruziana, xiv. 23 ; regia, xiv. 21, v. 114
Vieusseuxia glaucopis, i. 18
Viminaria denudata, xiv. 123
Vinca minor, v. 8 ; kinds of, adapted for planting in beds, ix. 230 ; notice of a double flowering kind, ix. 230
Vines in Madeira, xv. 196
Viola arborea, ix. 119 ; culture of genus, i. 115—122, ii. 144, iii. 249 ; odorata, iii. 249 ; tricolor, i. 116, ii. 144, 168, 192, iii. 5, xiv. 135
Violaceæ, ii. 261
Viper's bugloss, gigantic, v. 149
Virginia spider-wort, iii. 214
Virgin's bower, tubular-flowered, xiv. 31
Virgin soil, viii. 154
Viscaria oculata, xi. 92, 269, 270, x. 239
Vital envelope in plants, ix. 58 ; principle in plants, vi. 153, xi. 12, 251
Vlamingia, xv. 11
Volatile, or essential vegetable oils, xi. 156
Vriesia psittacina, x. 69, xv. 72 speciosa, xv. 166

U.

Ugoor, xv. 44
Ugooroo, xv. 44
Umbel, general nature of an, vii. 162
Umbilicus, character and office of the, vii. 258 ; malacophyllus, xi. 166
Uniformity in the treatment of exotic plants, desirableness of, vi. 167, 255
Urananthus glaucifolius, xiii. 99
Uses of earths, iv. 10

W.

Wahlenbergia grandiflora, xiii. 7
Waldron, Mr., on heating by hot-water, ii. 56 ; cost of apparatus, by, ii. 58
Walks, hints on gravelling and rolling, xi. 259
Wallflowers, their blooming season prolonged plucking the flowers, ix. 110
Walls, not most suitable for climbing plants, vi. 160 ; prejudicial in some parts of greenhouses, viii. 232
Wampu tree, xv. 261
Ward's cases, xiv. 42
Warratah, the, v. 73
Warrea cyanea, xii. 118 ; cærulea, xii. 118 ; *tricolor*, xiii. 141
Water, how to apply to the flower-garden in hot weather, xiii. 143 ; importance of mingling air with, vi. 12 ; its tendency to lower temperature, vi. 183 ; equally dangerous to plants in winter as cold, if excessive, vi. 263 ; component parts of, viii. 129, 177 ; its agency on vegetation, viii. 177 ; not a solvent of the earthy substance of manures, but of the gases evolved by them, viii. 178 ; what gives it softness, viii. 179 ; advantages of that produced by rain, viii. 179 ; importance of a free circulation of, v. 208 ; an indispensable feature in rockeries, v. 228 ; taken up by the roots, xi. 129 ; composition of, xi. 177 ; elements of, ix. 225 ; softness essential in that given to plants, ix. 228
Watering plants, hints on, v. 95 ; general principles to be observed in, vi. 96, 144, 168, vii. 47, 120, 215, 240, 255 ; rules for, viii. 119 ; directions for, ix. 71, 96,

119, 143, 192, 239; in winter, rules for, x. 264
Wavertree, mode of heating by hot-water at, ii. 62—64
Wavy-leaved Tree Rose Bay, iii. 212
Wax, analysis of, xi. 155
Waxen Dove-flower, iv. 117
Wax Palm, ii. 23
Weak-leaved Adam's Needle, iii. 263
Weather, usefulness of marking its peculiarities, vii. 81; work to be done during winter, viii. 263; interesting particulars respecting that of 1844-6, xiv. 9; importance of adapting the treatment of plants in houses to the, x. 264
Weeding by hand, suggestions on the propriety of, xi. 258
Weeping Willow, places in which it should be planted, viii. 162
Weigela rosea, xiv. 67, 118, 247, xv. 211; Mr. Fortune's account of, xiv. 247
West-coast Banksia, iv. 20
West Indian gooseberry, iv. 64
Wheeler's Monkey-flower, iii. 214
White Lily, narrow-sepaled, iv. 42
White Japan Camellia, iii. 71
Whitfieldia lateritia, xii. 94, 147; the way to manage properly, xii. 148; brick-coloured, xii. 147
Whortleberry tribe, ii. 209
Wigandia caraccasana, iv. 136
Wilhelm's-hoehe, fountain at, xi. 226
Wind-flower, history and culture of, ii. 16; Japanese, xiv. 25
Winds, reduction of temperature by, vi. 205; unless violent, beneficial to plants, vi. 206; and their influence on vegetation, vii. 81; advisability of screening tender plants from cold ones, viii. 71
Wine-stained Godetia, iii. 213
Winged Yam, iii. 200
Winged-leaved Vervain, iii. 45
Wing-point, large-flowered, xiv. 74
Wing-stemmed Lobelia, iii. 93
Winter management of hothouses, or plant stoves, ii. 237; treatment of plants, a test of the cultivator's ability, vii. 85; disagreeable contingencies of mild, ix. 203; gardens, xi. 252; a selection of plants for, xi. 253; to prepare plants for, xi. 256; retrospect of the late, xii. 81; phenomena of, xii. 249; preparatives to prevent injury from, xii. 250; phenomena of, xiv. 9; blooming plants, xiv. 131; management of plants, xiv. 233, 251
Wire-worm, modes of destroying, i. 74
Wistaria consequana, mode of training it, &c., iv. 135; its suitability for training to a pole, vi. 16, vii. 127; various plans for training, vii. 127; suggestions on propagating and pruning, vii. 128; sinensis, various situations for, and modes of managing, xi. 132
Witsenia corymbosa, iii. 269; maura, vi. 92, viii. 221; its management, viii. 222
Witty's patent gas furnace, i. 133; Mr. Wilmot's opinion of its advantages, i. 134; Mr. M'Intosh's, i. 134
Woburn Abbey, hot-water apparatus at, ii. 59, 60
Wood, porosity of, ii. 22; its formation and constituent parts, vi. 179; different hypotheses respecting its enlargement, vi. 179; origin and formation of, xi. 34
Wooden stands for training creepers to, iii. 31; rustic ornamental vases, iii. 258; roofs preferable to iron for plant houses, v. 35
Woodlouse, xiv. 69
Woody-fibre, analysis of, xi. 157; formation of, xi. 251
Wood-wort, two-coloured, v. 18, 163

X.

Xanthosia rotundifolia, iv. 136

Y.

Yam, iii. 200
Young gardeners, vi. 207
Young plants, vi. 87
Yucca aloifolia, iii. 25; draconis, iii. 263; filamentosa, iii. 25; flaccida, iii. 263; gloriosa, iii. 25

Z.

Zalacca Reed, xv. 235
Zanzee, xv. 38
Zapotilla Plum, xv. 107
Zauschneria californica, xv. 190, 195, 216, 234
Zedoary, i. 125
Zenobia speciosa, iii. 117
Zephyranthes, ii. 69; Drummondi, iii. 95
Zerumbet speciosum, xiii. 125
Zickya coccinea, x. 86; glabrata, ix. 168; molle, v. 93, ix. 119; pannosa, viii. 147; tricolor, vi. 211, vii. 71; villosa, ix. 119
Ziera lævigata, vii. 94, ix. 77, xiv. 225
Zigomeris flava, xiii. 173
Zinc for horticultural purposes, i. 155, 183, xii. 206
Zygoglossum umbellatum, xiii. 140
Zygopetalum africanum, vii. 166; cochleatum, iii. 144, iv. 166; Mackai, iii. 97, v. 186; maxillare, iv. 166, 271; rostratum, ii. 142

INDEX OF THE COLOURED FIGURES OF PLANTS

CONTAINED IN THE WHOLE OF THE FIFTEEN VOLUMES.

A.

Abutilon striatum, vii. 53
Acacia biflora, ix. 221 ; cultriformis, xi. 123 ; longifolia, iv. 197, xii. 271 ; oxycedrus, vii. 151 ; pulchella, iv. 198 ; rotundifolia, xv. 123 ; vestita, iii. 145
Achimenes grandiflora, ix. 151, x. 145 ; hirsuta, xii. 7 ; multiflora, x. 223 ; patens, xiii. 197 ; pedunculata, x. 271 ; picta, xii. 223 ; venusta, xv. 121
Acineta Barkerii, xiv. 145
Aconitum chinense, v. 3
Æchmea fulgens, x. 173
Ægiphila grandiflora, xiii. 217
Ærides Brookii, ix. 145 ; maculosum, xii. 49 ; quinquevulnerum, viii. 241 ; virens, xiv. 197
Æschinanthus Boschianus, xiii. 175 ; grandiflorus, v. 241 ; longiflorus, xv. 25 ; ramosissimus, vi. 195 ; speciosus, xiv. 199
Agalmyla staminea, xv. 73
Agrostemma Bungeana, iv. 7
Allamanda cathartica, viii. 77 ; grandiflora, xii. 79
Alona cœlestis, xii. 3
Alpinia nutans, xiii. 125
Alströmeria pelegrina alba, i. 199
Amaryllis formosissima, i. 149
Amicia zigomeris, xiii. 173
Amphicome arguta, vi. 79
Androsace lanuginosa, xiv. 50
Anemone japonica, xiv. 25.
Angelonia salicariæfolia, v. 75
Anigozanthus coccineus, v. 271
Anomatheca cruenta, i. 103
Ansellia africana, xiii. 241
Antirrhinum majus caryophylloides, v. 55 ; m. flore-pleno, xi. 99 ; m. quadricolor, x. 197 ; m. Youngii, xiii. 271
Aotus ericoides, v. 51
Aphelandra aurantiaca, xii. 127 ; cristata, vii. 173
Aphelexis humilis, xv. 271
Aquilegia Skinneri, x. 199
Arbutus procera, ii. 147
Aristolochia hyperborea, vi. 53 ; trilobata, iii. 2
Asclepias tuberosa, ii. 26
Astelma eximium, v. 103
Asystasia coromandeliana, xiv. 125
Azalea Chinese seedlings, xii. 55 ; Danielsiana, i. 129 ; marginata, ii. 121 ; pulchra, i. 126 ; Rawsonii, iii. 123 ; sinensis coccinea, ii. 121 ; Smithii, ii. 145 ; variegata, vii. 175

B.

Balsamina Mastersiana, vi. 75
Barbacenia purpurea, xii. 27 ; squamata, xi. 75
Barkeria Lindleyana, xiii. 193 ; Skinneri major, xv. 1 ; spectabilis, x. 169
Barnardesia rosea, xiii. 123
Barringtonia speciosa, x. 241
Batatas bonariensis, viii. 25
Batschia canescens, xii. 151
Beaufortia decussata, viii. 269 ; splendens, xiii. 145
Beaumontia grandiflora, xiii. 103
Begonia albo-coccinea, xiii. 245 ; coccinea, x. 73 ; fuchsioides, xiv. 217 ; Martiana, xii. 151 ; nitida, xiii. 77 ; odorata, iv. 123 ; platanifolia, iii. 125 ; ramentacea, xii. 73
Berberis dulcis, x. 171
Bignonia capreolata, viii. 245 ; Chamberlaynii, xiv. 3 ; picta, x. 125 ; venusta, vii. 123
Blandfordia grandiflora, vii. 219
Bletia Shepherdii, ii. 146
Boronia anemoneflora, ix. 123 ; crenulata, iv. 267 ; ledifolia, viii. 123 ; serrulata, i. 173
Bouvardia angustifolia, vii. 99
Brassia maculata, iii. 5
Brodiæa grandiflora, xii. 221
Brugmansia floribunda, ix. 3 ; Waymannii, iv. 241
Brunonia australis, vii. 267
Buddleya Lindleyana, xiv. 5
Bugainvillea spectabilis, xii. 51
Burtonia conferta, xii. 53

C.

Calandrinia umbellata, xii. 265 ; grandiflora, i. 222
Calceolaria bicolor, i. 246 ; corymbosa Jupiter, ii. 218 ; c. Talisman, iii. 27 ; Hopeana, ii. 266 ; integrifolia viscosissima, i. 269 ; Standishii, ix. 75
Calliopsis bicolor atrosanguinea, ii. 243
Callistachys longifolia, viii. 31
Calochortus luteus, i. 221 ; venustus, i. 175
Calystegia pubescens, xiii. 242
Camarotis purpurea, vii. 25
Camellia japonica Alberti, viii. 53 ; j. Chandlerii, ii. 73 ; j. Cunninghamii, ii. 122 ; j. Fordii, ii. 25 ; j. miniata, xiv. 169 ; j. mutabilis, ii. 122 ; j. Pressii rosea, v. 171 ; reticulata, iii. 101
Campanula grandis, x. 31
Campanula fragilis hirsuta, xi. 25 ; sylvatica, xii. 245
Cantua bicolor, xv. 219
Capsicum ustulatum, v. 197
Casselia integrifolia, xv. 75
Cattleya Aclandiæ, ix. 1 ; bulbosa, xv. 49 ; crispa, v. 5
Cattleya labiata, iv. 121 ; Harrisoniæ, iv. 247 ; labiata atro-purpurea, vii. 73 ; intermedia, i. 151 ; Skinneri, xi. 193 ; superba, ix. 265 ; marginata, x. 265 ;
Ceanothus cæruleus, ii. 74 ; azureus, ii. 74
Centradenia rosea, x. 101
Centropogon surinamiensis, xiii. 149
Cereus grandiflora Maynardii, xiv. 75
Cestrum aurantiacum, xiv. 77
Chænostoma polyantha, xiii. 31
Chætogastra strigosa, xv. 267
Chelone Lyonii, vii. 269 ; centranthifolia, ii. 50 ; obliqua, vii. 149
Chilodia scutellarioides, v. 195
Chirita sinensis, xiv. 243 ; Zeylanica, xiii. 265
Chironia floribunda, xii. 123 ; glutinosa, xv. 245 ; trinervis, iii. 149
Chorozema Dicksonii, viii. 173 ; Henchmannii, ii. 171 ; ovata, iv. 153 ; spartioides, x. 127 ; triangulare, xiii. 73 ; varium, vi. 175 ; cordata, v. 27
Cineraria seedlings, xii. 149 ; Welbankiana, ix. 126
Clematis cærulea, iv. 193 ; Sieboldii, iv. 147 ; tubulosa, xiv. 31
Clerodendron infortunatum, xi.

169 ; speciosissimum, iii. 217, 271 ; splendens, ix. 103
Clianthus puniceus, ii. 169
Clintonia pulchella, iv. 145
Clitoria fulgens, xi. 121; ternatea, vii. 147; t. major, xiii. 79
Cœlogyne Gardneriana, vi. 73 ; præcox, vi. 25 ; Wallichiana, vi. 25
Coleus barbatus, viii. 219
Collinsia bicolor, iii. 195
Columnea Schiediana, ix. 31 ; splendens, x. 5
Comesperma gracilis, v. 145
Combretum grandiflorum, ix. 169; latifolium, xii. 103
Comparettia rosea, x. 1
Conradia floribunda, xii. 99
Convolvulus pentanthus, vi. 219
Corræa, Gaines's seedlings, xii. 77, xiv. 147 ; bicolor, ix. 267 ; Harrisii, vii. 79 ; longiflora, vii. 195
Coryanthes macrantha, v. 21
Costus speciosus, iv. 245
Cratægus oxyacantha rosea, i. 198
Crowea latifolia, xiv. 222
Crotalaria verrucosa, xiii. 223
Cummingia trimaculata, xi. 127
Cuphea Melvillii, viii. 197; miniata, xiv. 101 ; platycentra, xiii. 267 ; strigulosa, xi. 241
Curcuma Roscoeana, vii. 1
Cyclogyne canescens, vii. 199
Cymbidium giganteum, xii. 241 ; eburneum, xv. 145
Cypripedium calceolus, iii. 247

D.

Daphne japonica, viii. 175
Daviesia ulicina, iv. 29
Delphinium Barlowii, v. 265 ; sinense flore pleno, vii. 170
Dendrobium amplum, vii. 121 ; anosmum, xv. 97 ; aggregatum, vi. 145 ; Cambridgeanum, vi. 265 ; densiflorum, v. 121 ; Dalhousianum, xi. 145 ; Devonianum, vii. 169; Farmerii, xv. 241; formosum, vi. 49 ; fimbriatum, ii. 172 ; Gibsonii, v. 161 ; Kingianum, xii. 97 ; macrophyllum, viii. 97 ; moniliforme, iii. 77 ; moschatum, ii. 241 ; nobile, vii. 7 ; Paxtonii, vi. 169 ; taurinum, x. 217
Dianthus Hendersonianus, xiv. 126
Dichorizandra ovata, xv. 3 ; thyrsiflora, iii. 127
Dielytra spectabilis, xv. 127
Digitalis purpurea superba, x. 29
Dillwynia clavata, xi. 5 ; speciosa, vii. 27 ; Glycinifolia, iv. 99
Diplacus puniceus, vi. 221
Dipladenia crassinoda, xii. 25
Diplopappus incanus, ii. 49
Donia punicea, ii. 169
Dracocephalum grandiflorum, xiii. 51
Dryandra longifolia, iii. 171

E.

Echinacea intermedia, xv. 79
Echites atropurpurea, ix. 199 ; splendens, x. 26 ; suberecta, vii. 101
Echium giganteum, v. 149
Epacris autumnale, xi. 195; grandiflora, i. 52 ; coccineus, vi. 123 ; miniata, xii. 5 ; impressa, ii. 97, iv. 126 ; variabilis, iv. 125, xv. 193 ; bicolor, xv. 193 ; campanulata, xv. 193 ; maxima, xv. 193 ; delicata, xv. 193 ; Tauntoniensis, xiv. 195
Epidendron bicornutum, v. 245 ; fragrans, ii. 217 ; macrochilum roseum, xi. 243; phœniceum, ix. 97 ; radicans, xii. 145 ; verrucosum, xiii. 101 ; Schomburgkii, x. 121 ; vitellinum, xi. 49
Epimedium macranthum, v. 151 ; violaceum, v. 123
Epiphyllum Russellianum, x. 245 ; truncatum violaceum, viii. 79 ; splendidum, i. 49
Eranthemum pulchellum, xi. 57 ; strictum, xiv. 171 ; variabilis, xiii. 75
Erica Banksiana, vii. 243 ; Cavendishiana, xiii. 3 ; Jacksonii, viii. 149 ; Macnabiana, vii. 125 ; Murrayana, xi. 77 ; Neillii, ix. 195 ; tricolor superba, vi. 3
Eriostemon scabrum, xiii. 127
Erysimum Perowskianum, vi. 245
Erythrina Bidwillii, xv. 51 ; crista-galli, iii. 175
Escallonia montevidensis, ii. 51
Eschscholtzia crocea, iii. 49
Eucalyptus macrocarpa, xv. 29
Euphorbia fulgens, iv. 31
Eustoma exaltatum, xiii. 99
Eutaxia pungens, iii. 245
Eutoca Wrangeliana, v. 199
Evolvulus purpureo-cæruleus, xv. 171

F.

Franciscea acuminata, xiii. 27 ; Hopeana, i. 80 ; hydrangeæformis, xiii. 121; latifolia, ix. 73
Fuchsia cordifolia, ix. 99 ; corymbiflora, viii. 7 ; Exoniensis, x. 151 ; fulgens, v. 221 ; globosa, ii. 75; g. elegans, iv. 75; macrantha, xiii. 97 ; radicans, ix. 27 ; serratifolia, xii. 169 ; Smith's seedling Victoria, xi. 73 ; Standish's seedlings, xi. 31

G.

Galeandra Baueri, xiv. 49; Devoniana, viii. 145
Gardoquia multiflora, vi. 223 ; Hookeri, iii. 243
Gardenia Devoniana, xiii. 269 ; Stanleyana, xiii. 169
Gastrochilus pulcherrimus, vii. 7
Gastrolobium spinosum, xi. 171
Gaylussacia pseudo-vaccineum, xii. 101
Gentiana septemfida, viii. 51 ; gelida, vii. 5
Gesneria Cooperii, i. 224 ; Douglassii verticillata, vi. 29 ; discolor, ix. 55 ; Gerardiana, xiii. 55 ; lateritia, ix. 245 ; mollis, viii. 271 ; oblongata, vi. 103 ; rupestris, v. 53 ; Selloi, iv. 27 ; zebrina, viii. 271
Gilia achillæfolia, i. 150 ; tricolor, i. 150
Gladiolus insignis, vii. 223; ramosus, vi. 99 ; Gandiensis, xi. 27 ; pudibundus, ii. 197
Gloxinia digitaliflora, x. 193 ; Passinghamii, xi. 267 ; maxima, v. 219 ; speciosa cerina, xi. 199 ; speciosa Cartoni, xi. 199 ; speciosa superba, xi. 199 ; rubra, vii. 277 ; albo-sanguinea, xv. 169 ; Fyfiana, xv. 169 ; Teuchlerii, xv. 169
Goldfussia glomerata, viii. 121
Gompholobium barbigerum, xiv. 221 ; Hendersonii, xi. 103 ; polymorphum, vi. 151 ; versicolor, xii. 219
Grammatophyllum multiflorum, vi. 217
Griffinia hyacinthina, xii. 171

H.

Habranthus pratensis, ix. 121
Habrothamnus fasciculatus, xv. 193
Hardenbergia Comptoniana, viii. 27 ; macrophylla, viii. 267
Helichrysum macranthum, v. 247 ; niveum, viii. 99
Heliconia Braziliensis, iii. 193
Heliophila trifida, xv. 219
Hemerocallis Sieboldi, v. 25
Hibiscus Cameronii, viii. 3 ; Jerroldianus, xiv. 1 ; Lindlei, i. 77 ; multifidus, vii. 103 ; splendens, iii. 147 ; syriacus variegatus, ii. 3
Hindsia violacea, xi. 197
Hovea Celsii, iii. 241 ; linearis, xiii. 75 ; pungens, vi. 101 ; p. major, x. 51 ; splendens, x. 103
Hoya bella, xv. 243
Houlletia Brocklehurstiana, ix. 49
Hydrangea japonica, xiii. 119
Huntleya violacea, viii. 1

I.

Illicium floridanum, v. 147
Impatiens scapiflora, v. 101
Inga pulcherrima, xi. 147
Ipomœa ficifolia, ix. 29 ; Horsfalliæ, iii. 50 ; Hardingii, xi. 217 ; Learii, vi. 267 ; rubro-cærulea, iii. 99 ; tryanthina, viii. 73
Ipomopsis elegans, i. 27 ; picta, i. 245
Iris bicolor, ix. 29 ; persica, xi. 77
Ismene Amancaes, iii. 267
Ixiolirion montanum, xiii. 151
Ixora Bandhooka, ii. 265 ; grandiflora, iii. 75 ; Javanica, xiv. 265

J.
Jacaranda mimosifolia, xi. 151 ; tomentosa, xii. 217
Jasminum nudiflorum, xv. 173
Justicia coccinea, i. 102

K.
Kæmpferia rotunda, i. 125
Kaulfussia amelloides, viii. 195
Kennedya coccinea elegans, ii. 99 ; splendens, iii. 26

L.
Labichea bipunctata, x. 150
Lælia acuminata, x. 49 ; anceps, iv. 73 ; autumnalis, vi. 121 ; cinnabarina, vii. 193 ; majalis, xii. 1 ; Perrinii, xiii. 5 ; superbiens, xi. 97
Lagerstrœmia elegans, xiv. 269 ; indica, xiv. 269
Lalage hoveæfolia, ix. 171
Lantana crocea, x. 53
Leianthus longifolia, xiii. 29 ; nigrescens, xiv. 149
Lemonia spectabilis, xiv. 73
Leptosiphon androsaceus, iii. 219 ; densiflorus, iii. 220
Leschenaultia arcuata, xiv. 246 ; biloba, viii. 151 ; splendens, xiv. 245
Leucocoryne alliacea, xi. 101
Leucothoe floribunda, iv. 101
Liatris borealis, v. 27
Lilium aurantiacum, vi. 127 ; lancifolium roseum, v. 267 ; speciosum album, viii. 127 ; speciosum, v. 1 ; testaceum, x. 221
Limodorum tuberosum, ii. 146
Linum trigynum, xi. 51
Lisianthus Russellianus, vi. 31
Lissochilus speciosus, iv. 25
Loasa Herbertii, ix. 269 ; lateritia, v. 77 ; Pentlandica, ix. 7
Lobelia cœlestis, xv. 103 ; erinus grandiflora, x. 75 ; fulgens propinqua, ii. 52 ; fulgens multiflora, xv. 7 ; heterophylla major, ix. 101 ; heterophylla, vi. 197 ; ignea, vi. 247
Lophospermum erubescens spectabilis, viii. 75 ; Rhodochiton, ii. 27
Luxemburgia ciliosa, xi. 3
Lycaste Skinneri, xi. 1
Lychnis coronata, ii. 1 ; grandiflora, ii. 1

M.
Mahonia aquifolium, ix. 5 ; glumacea, vii. 55
Malope trifida grandiflora, i. 177
Malva campanulata, ix. 173 ; Creeana, vi. 55 ; Munroana, iv. 269
Manettia bicolor, x. 27 ; cordifolia, ii. 267
Marianthus cæruleo-punctatus, viii. 247
Marica cærulea, i. 128 ; Sabini, i. 81
Martynia lutea, xi. 149
Maxillaria Deppei, ii. 268 ; Harrisoniæ, ii. 196
Medinilla erythrophylla, x. 79
Melastoma sanguinea, xii. 269
Mesembryanthemum tricolor, ix. 219
Miltonia Clowesii, ix. 241 ; candida, vi. 241 ; Russelliana, vii. 217 ; spectabilis, vii. 97
Mimulus cardinalis, iii. 197 ; Harrisoniæ, iv. 173 ; Maclainianus, ix. 147 ; roseus, i. 29 ; Smithii, i. 54 ; variegata, i. 79
Mirbelia floribunda, viii. 103
Mitraria coccinea, xv. 147
Muraltia Heisteria, iv. 150 ; stipulacea, iv. 149
Musa Cavendishii, iii. 51
Mussœnda macrophylla, xii. 197
Mutisia ilicifolia, xv. 101
Myanthus barbatus, ii. 124

N.
Neirembergia Aitkinsiana, ii. 173 ; intermedia, ii. 219
Nemophila atomaria, v. 99 ; insignis, iii. 151
Nepenthes distillatoria, iv. 1
Nerium Oleander Tanglé, xi. 55 ; thyrsiflorum, iii. 73
Nuttalia grandiflora, v. 217 ; malvæflora, vii. 31 ; papaver, vi. 173
Nymphæa rubra, xi. 265

O.
Odontoglossum Cervantesii, xii. 193 ; cordatum, xiii. 147 ; grande, viii. 49
Oncidium Barkeri, xiv. 97 ; citrinum, iv. 77 ; divaricatum, iii. 4 ; Insleayii, viii. 265 ; Lanceanum, iv. 169 ; leucochilum, vii. 241 ; papilio, v. 175 ; spilopterum, xv. 203
Ornithogalum aureum, xii. 175
Orphium frutescens, xiii. 221
Orthrosanthes multiflora, xi. 245
Oxylobium obovatum, x. 243 ; pultenæa, ix. 149

P.
Pæonia edulis Reevesiana, i. 197
Pancratium calathinum, iv. 53
Pascalia glauca, viii. 125
Passiflora Middletoniana, ix. 51 kermesina, i. 25 ; k. Lemecheziana, xiv. 151 ; Neumannii, xv. 269
Paulownia imperialis, x. 7
Pentas carnea, xi. 125
Pentstemon argutus, vi. 271 ; crassifolius, ix. 197 ; Cobœa, iv. 243 ; gentianoides, iv. 265 ; g. splendens, ix. 175 ; McEwanii, xiv. 174 ; Murrayanus, iii. 265 ; ovatum, xiii. 199 ; speciosa, vi. 171
Petræa Stapelsiæ, iv. 199
Petunia linearis, ii. 219 ; nyctaginiflora violacea, ii. 173 ; punctata, xi. 7 ; violacea, i. 7
Phacelia vinifolia, iii. 121
Phaius albus, v. 125 ; Wallichii, vi. 193
Phalænopsis amabilis, vii. 49
Pharbitis ostrina, ix 243
Phaseolus Caracalla, x. 267
Philibertia grandiflora, vi. 7
Phlox cordata grandiflora, i. 268 ; Drummondii, ii. 221 ; Leopoldiana, xiv. 266 ; Oldryana, vii. 197 ; Van Houtii, xi. 173
Physostegia imbricata, v. 173
Platycodion grandiflorum, xiii. 7
Platylobium formosum, xiii. 195 ; parviflorum, xi. 219
Pleroma elegans, xv. 27 ; Kunthiana, xii. 125 ; petiolata, xi. 267
Plumbago Larpentæ, xiv. 267
Podalobium staurophyllum, iv. 171
Poinciana pulcherrima, iii. 3
Poinsettia pulcherrima, iv. 97
Portulaca Thellusonii, viii. 29
Porphyrocoma lanceolata, xiv. 53
Potentilla Macnabiana, xiii. 219 ; Menziesii, xv. 247 ; ferruginea, v. 223 ; Hopwoodiana, vi. 149
Pronaya elegans, xii. 99
Pterostigma grandiflora, xiv 74

R.
Raphistemma pulchellum, xiv. 27
Renanthera coccinea, iv. 49
Rhodanthe Manglesii, iii. 173
Rhodochiton volubile, ii. 27
Rhododendron arboreum, i. 101 ; a. fimbriatum, ii. 98 ; a. Paxtonii, xiv. 99 ; chamæcistus, iii. 169 ; Gibsonii, viii. 217 ; fragrans, x. 147 ; indicum Smithii, ii. 145 ; javanicum, xv. 217 ; pulchrum, i. 126 ; Smithii aureum, ix. 79 ; Standishii, xv. 55
Ribes albidum, x. 55 ; sanguineum, i. 3 ; s. flore pleno, xii. 121
Rigidella flammea, vii. 257 ; orthantha, xiv. 121
Roella ciliata, vii. 245 ; elegans, vi. 27
Rondeletia longiflora, ix. 217 ; speciosa, ii. 242
Rosa Devoniensis, viii. 160 ; Hardii, x. 195
Rudbeckia Drummondii, vi. 51
Ruellia lilacina, xii. 195 ; macrophylla, xiv. 29
Russelia juncea, iv. 79

S.
Saccolabium ampullaceum, xiii. 49 ; calceolaria, vi. 97 ; denticulatum, vii. 145
Salpiglossis linearis, ii. 220
Salvia azurea, xii. 31 ; bicolor, ix. 271 ; linarioides, vii. 77 ; oppositiflora, xv. 53 ; strictiflora, xi. 247 ; patens, vi. 1 ; prunelloides, xv. 175
Sarracenia purpurea, iii. 221
Satyrium aureum, xv. 31
Schizanthus Evansianus, viii. 171 ; pinnatus humilis, ii. 198 ; Priestii, i. 31 ; retusus, i. 5

Scutellaria japonica, x. 123; splendens, x. 99
Scilla bifolia, xiv. 100; sibirica, xiv. 100
Scypanthus elegans, x. 3
Sericographis Ghiesbreghtiana, xv. 176
Silene laciniata, i. 267; speciosa, x. 219
Sinningia guttata, ii. 4; Youngeana, vii. 51
Siphocampylus betulæfolius, ix. 223; bicolor, iv. 195; coccinea, xii. 173; manettiæflorus, xv. 265; nitida, xv. 267
Sobralia macrantha splendens, xiv. 241
Solanum crispum, iii. 1; Herbertianum, v. 269; jasminoides, viii. 5
Sophronitis grandiflora, ix. 194
Sphenogyne speciosa, vi. 77
Spiræa Douglassia, xii. 195
Stachys coccinea, viii. 101
Statice arborea, iv. 217; pseudoarmeria, xi. 29
Stenocarpus Cunninghamii, xiv. 1
Stephanotis floribunda, xi. 29
Stigmaphyllon ciliatum, xv. 77
Streptanthera cuprea, i. 8
Stylidium scandens, xv. 149
Styphelea tubiflora, xii. 29
Swainsonia coronillæfolia, xv. 223

T.

Tacsonia mollissima, xiii. 25; pinnatistipula, 249
Tecoma jasminoides, vi. 199
Telopea speciosissima, v. 73
Tetratheca hirsuta, xiii. 53; verticillata, xiii. 171
Thunbergia alata, ii. 2; alata alba, iii. 28; aurantiaca, vi. 269; aurantiaca Doddsii, xv. 221; chrysops, xi. 221; grandiflora, vii. 221; Hawtayneana, vi. 147
Thysanotus intricatus, vi. 243; proliferus, vii. 29
Tigrida conchiflora Watkinsoni, xiv. 51
Tillandsia stricta, xv. 125
Torenia asiatica, xv. 197; arracanensis, xv. 197; edentula, xv. 197; concolor, xv. 197; scabra, ix. 53
Triptilion spinosum, x. 269
Tritonia aurea, xv. 3
Tropæolum azureum, ix. 247; brachyceras, iv. 55; edule, ix. 127; Jarrattii, v. 29; majus atrosanguineum, i. 176; majus venustum, ii. 193; Moritzianum, viii. 199; Lobbianum, xi. 271; polyphyllum, x. 175; speciosum, xiv. 173; tricolorum, ii. 123; tuberosum, v. 49
Tweedia cærulea, vi. 125

V.

Vanda teres, v. 193; tesselata, vii. 265
Verbena amœna, vii. 3; Melindres, i. 173; teucrioides, v. 243; Tweediana, iv. 5
Veronica Lindleyana, xii. 247; speciosa, x. 245
Viminaria denudata, xiv. 123
Viscaria oculata, xi. 269

W.

Weigela rosea, xiv. 247
Whitfieldia lateritia, xiv. 147
Wistaria Consequana, vii. 127
Witsenia corymbosa, iii. 269; maura, viii. 221

Y.

Yucca aloifolia, iii. 25

Z.

Zauchneria californica, xv. 195
Zichya pannosa, viii. 147
Zieria lævigata, ix. 77
Zinnia violacea coccinea, i. 223
Zygopetalon Mackai, iii. 97; maxillare, iv. 271

LONDON
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

SMITHSONIAN INSTITUTION LIBRARIES

LIBRARIES SMITHSONIAN INSTITUTION

SMITHSONIAN INSTITUTION WASHINGTON D.C.

BOUND BY HW